

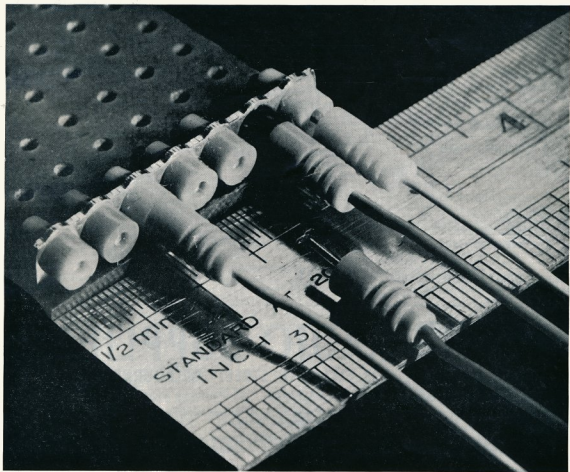
amateur radio

Vol. 38, No. 9

SEPTEMBER, 1970

Registered at G.P.O., Melbourne, for
transmission by post as a periodical

Price 30 Cents



CRYSTALS

CITIZENS BAND AND MODEL RADIO CONTROL FREQUENCY CRYSTALS

HC10 Miniature, 1/4 inch spacing.		
26.540 MHz.	26.995 MHz.	27.240 MHz.
26.590 MHz.	27.045 MHz.	27.245 MHz.
26.640 MHz.	27.095 MHz.	27.425 MHz.
26.690 MHz.	27.145 MHz.	27.740 MHz.
26.785 MHz.	27.195 MHz.	27.785 MHz.
26.790 MHz.		27.880 MHz.

PRICE \$3.50 EACH

AMATEUR CRYSTALS

VHF Band — 144 MHz. FM

HC8 Holders, 1/2 inch spacing.

Channel A	Transmit	4.051.55 KHz.
Channel A	Receive	10.275.35 KHz.
Channel B	Transmit	4.055.5 KHz.
Channel B	Receive	10.285.71 KHz.
Channel C	Transmit	4.059.61 KHz.
Channel C	Receive	10.296.14 KHz.
Channel 4	Transmit	4.066.68 KHz.
Channel 4	Receive	10.278.57 KHz.
Channel 1	Transmit	4.068.33 KHz.
Channel 1	Receive	10.257.14 KHz.

PRICE \$5.50 EACH

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100 KHz. Marker	...	\$12.00
1,000 KHz. Marker	...	\$12.00
3,500 KHz. Marker	...	\$5.50
5,500 KHz. Marker	...	\$5.50

COMMERCIAL FREQUENCY CRYSTALS

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2.182 KHz.	2.637 KHz.	4.335 KHz.
2.524 KHz.	2.739 KHz.	6.260 KHz.
2.603 KHz.	2.979 KHz.	6.735 KHz.
	4.095 KHz.	

PRICE \$5.50 EACH

VIDEO PEAKING CHOKES

MINIATURE PIGTAILS, IRONCORE

15 uH.	22 uH.	27 uH.	33 uH.	39 uH.	47 uH.
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1 Watt Audio Amplifier

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Postage \$1

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3 inch	8 ohm V.C. 20c
4 inch	8 ohm V.C. 20c

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amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910



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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence; in addition, "A.R." should also be notified. A convenient form is provided in the "Call Book".

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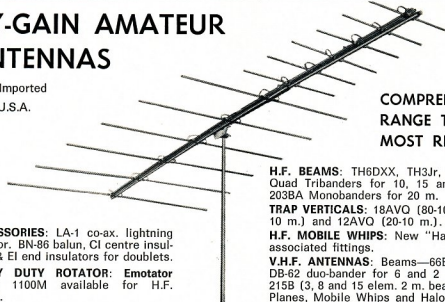
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COVER STORY

Our cover this month shows the latest in sub-miniature sockets and plugs. Manufactured by Oxley Developments Co. Ltd., U.K., they are designed for printed circuit board applications and employ a patented cone-lock principle to ensure reliable fixing of the socket tube, and the insulating bush in the mounting frame. Our illustration is by courtesy of R. H. Cunningham Pty. Ltd., who are the Australian agents for Oxley.

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TRAP VERTICALS: 18AVQ (80-10 m.), 14AVQ (40-10 m.) and 12AVQ (20-10 m.).

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V.H.F. ANTENNAS: Beams—66B six elem. 6 m., DB-62 duo-bander for 6 and 2 m.; 23B, 28B and 215B (3, 8 and 15 elem. 2 m. beams). Also Ground Planes, Mobile Whips and Halos.

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South Aust. Rep.: FARMERS RADIO PTY. LTD., 257 Angus St., Adelaide, S.A., 5000. Telephone 23-1268
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FR-DX-400 de luxe Receiver, 160 to 19 metre Ham bands ... \$375
FR-DX-400 super de luxe model Receiver with all the available accessories built in, 500 Hz. CW filter, FM filter and FM discriminator and 2 and 6 metre solid state Converters ... \$475
FT-200 economy Transceiver, with extra heavy duty AC power supply-speaker unit for 230-240-250v., adjustable ... \$410
FL-DX-200 Linear Amplifier, built-in AC supply and SWR meter ... \$325
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FR-DX-400 super de luxe Receiver ... \$325
FF-30-DX Low Pass Co-ax. Line Filter ... \$15
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FT-DX-400 External VFO for the FT-DX-400 and FT-DX-100 Transceiver ... \$90

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SW350C Transceiver with AC supply-speaker unit ... \$350
SW350C with Swan 14-230 AC/DC power supply unit ... \$600

HY-GAIN

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TH6DXX tri-band senior Beam, 10-15-20 m., 1KW. AM ... \$320
TH3Jr tri-band junior Beam, 10-15-20 m., 600w. PEP ... \$120
14AVQ 10 to 40 m. four-band Vertical, 1KW AM ... \$82
18AVQ 10 to 80 m. five-band Vertical, 1 KW AM ... \$85

MOSLEY

TAS3UR tri-band 10-15-20 m. junior Beam, 600w. PEP ... \$105

NEWTRONICS

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CRYSTALS FT-1241 series, chan. 0-79, full box from 375 to 515 KHz. \$15
Individual channels, 20c to 32, depending on frequency.

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WEBSTER Bandspanner, 10-80 m. centre-loaded, continually adjust. \$55
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CDR Ham-M heavy duty Rotator with indicator-control unit, for up to 2 inch masts, the proven Amateur Rotator since 1955 ... \$165
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FILTERS: KOKUSAI Mechanical Type, 500 Hz. CW pass band ... \$20

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CO-AX. CABLE: All 52 ohm type, prices per foot, any lengths: 3/16 inch diam. Type RG-58-U, \$0c; 3/8 inch diam. type RG-8-U, \$0c

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TRANSFORMERS: Still certain types of NATIONAL Transformers and Chokes in stock at give-away prices, ask for list and literature and pictures of all the above goodies. Sales tax included in all prices but postage, freight, insurance or registration are extra!!

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					Plate Volts	Plate Amperes		
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4CX600F	26.5							
4CW800B	6.0	890	5-PIN SPEC.	Liquid	3000	0.6	750W	WIDEBAND AMPLIFIER SERVICE
4CW800F	26.5							
4CX600J	6.0	150	OCTAL SPEC.	Air	3000	0.6	750W	CLASS AB-1 LINEAR SERVICE
860J								

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Suite 1, 339 Coronation Drive, Toowong, Qld., 4066. Phone 71-3277.
10 Stirling Highway, Nedlands, W.A., 6009. Phone 86-7493.

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AND OUTPUT

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0.005% \$5.50

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• Swan TV2 Transverter	290.40
• Swan A.C. Power Supply-Speaker	85.00
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• Hallicrafters HT37 Transmitter	140.00
• Pierce Simpson Marine Transceiver, 80 watts	350.00
• Pierce Simpson, 40 watts	189.00
• Swan VX2 Vox Unit	39.25
• Swan C.W. Filter	32.00
• Duke 5 Transceiver	399.75
• Hallicrafters CB5	45.00
• Swan 420 V.F.O.	140.00
• C.D.R. Rotator	45.00
• Pierce Simpson Depth Sounder	99.00
• Jackson Transmitter Condenser, 300 pF.	5.00
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• Swan Carrier Switch and Trimmer ..	85c
• Jackson Trimmers, Ceramic ..	1.25
• Swan Drive Drums ..	1.25
• B. & W. Plate Chokes (Linear) ..	3.75
• B. & W. Filament Chokes (Ferite, G.G.)	7.50
• B. & W. Phase Shift Network ..	4.50
• Dow Key Pre-Amps.	4.50
• Electronic TR Switches	5.20
• Dow Key Co-ax. Switches	6.25
• Dow Key Relay Coils	1.25
• Coil Stock, B. & W.	80c
• Hansen S.W.R. Bridges	12.00
• LED Two-Tone Oscillators	16.00
• Dipole Centre Insulators	85c
• Swan 350 pF. Load Capacitors	3.50
• Polar Ceramic Air Trimmers	95c
• Transmitter Crystals	2.10
• 100 KHz. Crystals (Cal.)	4.50
• Marine Radio Crystals	2.50
• Alternator Diodes, 50 Amp.	2.75
• OC35 Transistors	4.37
• 10 Volt Zener Diodes	1.70
• PL259 Co-ax. Connectors ..	80c
• 3-contact Mike Connectors (screw type)	80c
• Bay Roy all weather Co-ax. Relay	16.00
• English Sceptor Depth Sounder	29.00

★ Stocktake Sale ★

• Swan Sideband Selector Kit	\$16.00
• Swan Mobile Mounting Kit	12.00
• Swan Bal. Mod. Transformer	1.28
• Crystal Mechanical Filter	8.00
• ADY26 Transistors, 35 Amp.	4.37
• Jones Plugs, 12-pin, Swan	80c
• Jones Sockets ..	80c
• 2N1522 Transistors ..	4.25
• 2N1518 Transistors ..	4.25
• Sigma Relays	2.05
• 10K Push-Pull Switch Pots	80c
• Jabel 4-pole Switch	50c
• Hammarlund HFA-140 Condenser	1.25
• B. & W. Co-ax. Switches	6.50
• TS12/40 Transformer	1.68
• 3-contact Jack Plugs ..	80c
• 3-contact Socket	75c
• 5 watt 4.7 ohm Resistors	18c
• Swan 350 Main Tuning Knob, Metal ..	80c
• Swan Main Tuning Knob	25c
• 0-50 Micro. Amp. Meter	4.50
• Swan Meters, all Models ..	12.75
• 21ZA Mobile Mike (Ceramic, P.T.T.) ..	12.00
• Swan 240V. A.C. Power Supply Transf.	15.00
• RG10 Q Multiplier ..	26.00
• CR45 Receiver	35.00
• RG8U Cable ..	yd. 52c
• RG58U Cable	yd. 24c
• TA31 Junior Beam ..	33.00
• TA32 Junior Beam ..	38.00
• TA31 and 32 Conversion Kits ..	33.00
• Hy-Gain 2 Metre Beam ..	30.50
• Swantenna Mobile, All Band ..	72.00
• Hallicrafters SX146 Receiver	334.00
• GOTHAM FULL SIZE BEAMS:	
Y203 20 Metre 3 Element ..	45.00
Y153 15 Metre 3 Element ..	31.00
Y104 10 Metre 4 Element ..	37.00
Y69 6 Metre 9 Element ..	59.00
Y212 2 Metre 12 Element ..	53.00
Triband Quad ..	70.00
• SWAN HORNET:	
BT750-3 Triband, 1.5 KW.	146.00

Note.—All above Prices plus Sales Tax except Hallicrafters SX101A and HT37.

W.F.S. ELECTRONIC SUPPLY CO.

12 BOWDEN STREET, NORTH PARRAMATTA, N.S.W., 2151

Phone 630-1621

THE AMATEUR'S CODE

Over the years, the A.R.R.L. Handbook has made a feature of the Amateur's Code, and I can recall previous editorials in this magazine on the same subject. The code is, or should be, known to all Amateurs, and it is left to the individual to decide whether or not he follows it as his conscience may dictate, as on most points it is within his own control.

There is, however, one point where circumstances are such that outside influences can affect his thinking. This point is the fifth in the code, namely: "The Amateur is Balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community."

After close on 20 years in association with W.I.A. affairs, I am firmly convinced that in all spheres, both on a Divisional and Federal level, the average Amateur expects far more than can be reasonably expected from those who bear office in the Institute. What the cost must be either in cash or time, irrespective of whether the office-bearer is an employee or self employed, does not bear thinking about, but however it is calculated, the fact remains that the office-bearer, whoever it may be, is neglecting some other facet of his life.

Whilst it is admitted that some self-sacrifice is expected when nominating

for office, very few realise just what they are committing themselves to do. The Federal Executive was well aware of the problem when they submitted a proposal to the Federal Council last Easter that a full-time paid Secretary/Manager was required to handle the routine work of the Federal body, and the longer it was left the worse the position would become, until such time that the work of the Federal body would grind to a halt due to sheer complete over load.

Although not completely rejected, little or no useful discussion eventuated, the crux of the matter being that members could not afford the expense of such an employee of the Institute. It was left to Federal Executive to formulate a policy for future consideration, thus effectively increasing the work load on that body.

I now submit that it is time for the members of the W.I.A. to do something concrete to help their office-bearers to recover their balance, firstly by undertaking some of the work to be done within their Divisions, and, secondly, by being prepared to meet the costs required to maintain a worthwhile and responsible Institute.

Remember, we are discussing not a suburban tennis club but **THE WIRELESS INSTITUTE OF AUSTRALIA.**

—K. E. Pincott, VK3AFJ.

MEASUREMENT OF R.T.T.Y. FREQUENCIES

DR. K. M. KELLY,* VK4MJ

During the past few months, the writer has become interested in r.t.t.y. and has been constructing a demodulator. During this exercise it became necessary to provide some method of obtaining accurately measured frequencies, preferably in the form of a good sine-wave. It seemed that the answer would be to construct a simple tunable audio oscillator, with sufficient tuning range to cover the commonly used r.t.t.y. frequencies, and accordingly this was commenced.

Ever tried to do this? It quickly became apparent that there were various catches. An oscillator which gives a good waveform tends to have low output, and cannot be tuned over a useful range without great variations in output. An oscillator which gives good output without much variation over the tuning range usually suffers in waveform. Finally, most oscillators which, in fact, do come up to the mark are so delicately compensated to make, and then their calibration is not accurate enough unless considerable trouble is taken.

Enquiry from the local electric supply authority reveals that the maximum deviation in the frequency of the 50 cycle mains under ordinary conditions is ± 0.1 cycle, which, if used for calibration, will give a maximum error of 6 cycles at 2975 cycles, which is the highest frequency we are interested in measuring for r.t.t.y.

CALIBRATION

The oscillator is allowed to warm up and the output is connected to the "external timebase" of an oscilloscope. A signal from the 50 cycle mains is connected to the vertical amplifier of the c.r.o. The fine adjustment pot. is set at mid point, and the main fre-

frequency also commonly used of 1275 comes with a 3:1 figure, and the shift frequency of 850 gives a 2:1 figure.

The fine adjustment pot. is used to make the figures stand still for easy counting, but if a good reduction drive is included on the main pot., the fine one may be omitted.

On the Creed teleprinter, the neon output will give a correct strobe on the governor wheel for 50 bauds at 425 cycles, but for 45.5 bauds the frequency would need to be adjusted to 386.45 cycles. There is no Lissajou figure for this frequency, but a figure of the ratio 23:3 gives 383.3 cycles, which is pretty close, with an error of less than 1%.

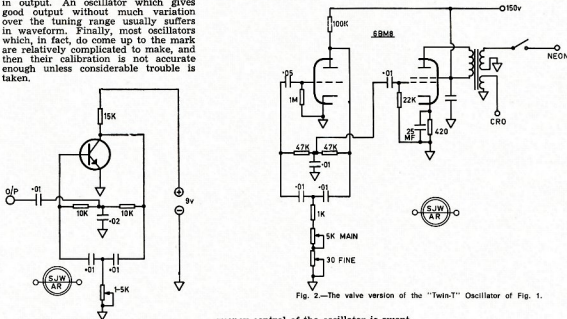


Fig. 2.—The valve version of the "Twin-T" Oscillator of Fig. 1.

Fig. 1.— The "Twin-T" Oscillator from "QST".

After a grand search of the literature, and much experiment, I discovered a little talked about oscillator, the "Twin-T",¹ which proved to be very tame, and also simple to construct. The circuit as published in "QST" is reproduced here (Fig. 1) and was found to work well, with a frequency range of 2:1 easily obtained. A valve version was then constructed, and found to work equally well.

In Fig. 2 is shown the final article, which tunes from 350 to 550 cycles. The output transformer is actually a small modulation transformer, arranged to drive a neon lamp to strobe the teleprinter when adjusting the speed of the machine, and is not essential in any way to the argument which follows.

quency control of the oscillator is swept until a Lissajou figure is obtained. These will indicate the multiples of 50 cycles and can be identified quite easily, by reference to the pretty pictures in the A.R.R.L. Handbook.

Now we must find the frequency in which we have the most interest—425 cycles. The Lissajou figure for this will be the one for $(50 \div 2) \times 17$. In other words, there will be 17 peaks on the sides of the scope, and two peaks on the top or bottom.

Having now set the oscillator to 425 cycles, the input from the 50 cycle mains can now be removed, and the output of another audio oscillator (or the beat note from the station receiver) is substituted. Using the 425 cycle timebase, simple Lissajous figures for 2125 (5:1), and 2975 (7:1) can be measured with extreme accuracy. Note also that the centre frequency of 2550 (6:1) may be obtained. The alternate

PROVISIONAL SUNSPOT NUMBERS

MAY 1970

Dependent on observations at Zurich Observatory and its stations in Locarno and Arosa.

Day	R	Day	R
1	128	16	176
2	128	17	176
3	124	18	176
4	121	19	179
5	115	20	149
6	117	21	168
7	100	22	127
8	88	23	168
9	91	24	124
10	113	25	112
11	137	26	125
12	148	27	128
13	151	28	108
14	148	29	120
15	162	30	118
		31	129

Mean equals 131.1.

Smoothed Mean for Nov, 1969: 105.0.

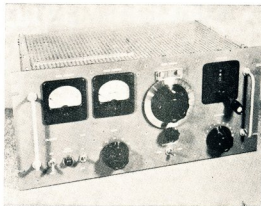
- Swiss Federal Observatory, Zurich.

* 285 Monaco St., Surfers Paradise, Qld., 4217.
1. "OST" Sept. 1968, p. 37.

Home-Brew Five-Band Linear Amplifier*

A CONSERVATIVELY DESIGNED CIRCUIT
USING TIME-PROVEN 811-As

HARRY R. HYDER, W7IV



IT is customary to preface a construction article with a few remarks about why the author decided to build rather than buy the equipment described. In my case, there's only one reason why I build radio equipment: I enjoy it.

I don't enjoy hole drilling or coil winding any more than an artist enjoys mixing paint or cleaning brushes. My satisfaction comes from creating something unique from my own mind and hands.

I read the construction articles in "Ham Radio" and other magazines every month, but I've never built equipment that exactly duplicates a published description. What I look for is not something to copy, but rather the construction hints and ideas that I can adapt to my own requirements.

This article is presented in that spirit. You may not wish to copy this linear amplifier, but you could do worse. Perhaps you'll find something you can use in your next construction project.

CIRCUIT DESCRIPTION

Parallel 811As are used in a grounded grid circuit (Fig. 1). In terms of watt-per-dollar of tube cost, the 811A must head the list. Some Amateurs complain of a short life for these tubes when operated at I.C.A.S. ratings as these are; however, I find it's easier to buy a couple of inexpensive tubes frequently rather than a single expensive tube occasionally.

The cathode circuit has a matching network to transform the 50 ohm input to approximately 150 ohms required by the tubes. A cathode matching network is often dispensed with, but it has its virtues. A 3:1 mismatch is frequently beyond the capability of some exciters. If the exciter doesn't have some power to spare, it may not be possible to drive the amplifier to full output without the network. With the matching network, the transmission line is "cold" and may be of any reasonable length. Some writers have reported that the matching network also improves amplifier linearity. Therefore, since it's simple and requires no tuning, it's cheap insurance.

The network is an L configuration on 80, 40 and 20 metres, changing to a pi network on 10 and 15 metres. The high effective cathode-to-ground capacitance, consisting of tube and wiring capacitance plus the distributed capacitance of the filament choke, precludes the use of an L network on the two higher frequency bands. The tapped 20, 40 and 80 metre cathode inductance is in the circuit at all times. On 10 and 15 metres, small self-supporting air-wound coils are connected in parallel with it. This is merely a switching convenience.

The plate tank coil is a roller-type inductor for the low frequency bands, with a series-connected small coil for 10 metres. The variable inductor permits adjustment for optimum Q on all frequencies.

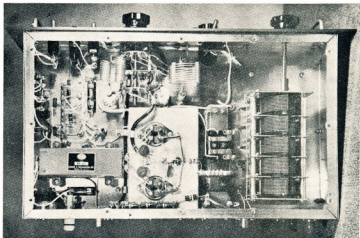
The plate tank capacitor is from a BC375 tuning unit. Its original capacitance range was 23 to 140 pF. I wanted to reduce minimum tank capacitance on the high frequency bands to lower the loaded Q and increase efficiency. I carefully split the stator with a fine saw. Only one of the sections is used on the high frequency bands, reducing the minimum tank capacitance by about

12 pF. This decreases the loaded Q on 10 metres from 26 to 20, and on 15 metres from 19 to 15. The photos show the switching arrangements to cut in the second section. The contacts are from an old relay, and the solenoid is a 115v. a.c. unit I happened to have in my junk box. The solenoid is controlled by a front-panel switch.

The loading capacitor is a five-gang 420 pF. per section unit that came from an MN26 radio compass. Two sections in parallel are used on the higher frequencies; the remaining three are cut in by a relay controlled by the tank capacitor switch. The capacitor is available from Barry Electronics.

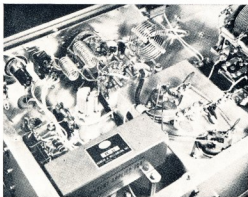
At 1500 volts, 811As require about 4.5 volts bias, which is supplied by a 4.7 volt zener in the filament return. This is less expensive and more reliable than a bias supply, and has a very low impedance. A 100 volt zener is also in the filament return, with a small amount of d.c. current bled through it. This provides full cut-off bias. It can be cut out by a front panel switch, or by external relay contacts.

The plate-current meter is also in the filament return, but reads plate current only; not total cathode current.

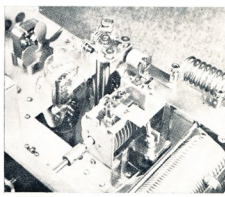


* Reprinted from "Ham Radio," March 1970.

Bottom view of the Linear Amplifier. Note lead dress and method of securing cables.



Left—Circuit details and component layout of input section. Attention to detail results in a professional appearance.



Right—Detail of the amplifier tank circuit. The small coil in the binding posts is the 10 metre inductor.

The grid-current meter is in the d.c. grid return.

The high-voltage bleeder consists of four 150K ohm 2-watt resistors in series, since it is not good practice to put more than about 500 volts across a single 2-watt resistor. I like redundant bleeders; should the one in the power supply open, the one in the amplifier will discharge the filter capacitors in a few seconds. A neon lamp indicates high voltage on the amplifier.

CONSTRUCTION

The chassis is aluminium, 10 x 17 x 3 inches. The 811As are mounted on a 4 x 6 x 1 1/2 inch aluminium chassis upside down. I made these chassis sides and the meter shields from pieces bought in a scrap-metal yard.

The cover shield is cane-pattern sheet aluminium from a "do-it-yourself" department of a hardware store. This material is rather flimsy, so I stiffened

it and improved the r.f. shielding with 1/2 x 1/16 inch aluminium strips on the outside. The 1/2 x 1/16 inch aluminium angle stock that holds the shield assembly was also obtained in the scrap metal yard, but the same material is sold as trim in most hardware stores.

WIRING

All power and control wiring should be installed first. Plan the wiring so that when the individual wires are joined into cables, the cables will run parallel to the main chassis dimensions. Strip each wire and tin it at both ends before placing it into the chassis. Leave a generous "service loop" when determining length; this makes parts replacement easy.

Lacing the cables adds a lot to the appearance. Flat nylon ties are good. Start at the cable centre and work toward the ends, bringing out individual wires as required.

Conductors in low level r.f. circuits consist of bare tinned bus bar. Output circuits are brass or copper strip about 0.02 inch thick. These strips should be secured with screws and nuts rather than solder. For appearance, sand the strips and spray them with clear lacquer.

THE PANEL

I prefer grey wrinkle to all other finishes. I purchase a blank panel with a black-wrinkle finish, complete all drilling, then spray it with "machine grey" lacquer. Several light coats are better than one heavy coat; the lacquer adheres better, and there's less tendency for the lacquer to fill in the original black finish. This makes for color standardisation, because no two grey-wrinkle panels are of the same hue, even from the same manufacturer's lot.

Another finish, used on my amplifier, requires nothing but a wire brush. Clamp the piece to a flat surface and make straight, even strokes with the brush. It produces a beautiful grained finish.

Whatever finish you use, handle the pieces with cloth gloves—fingerprints really stand out. Dust off the pieces and give them a couple of light coats of clear lacquer. Surfaces to be joined should be masked to obtain good electrical contact.

(Continued on Page 14)

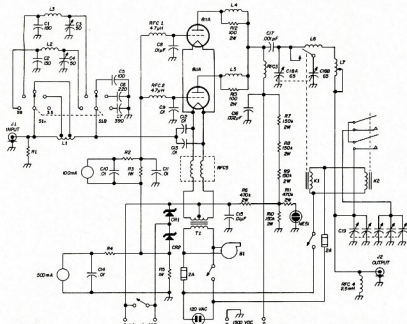


Fig. 1.—Schematic of the 811A Grounded-Grid Linear Amplifier. Matching section in cathode circuit provides a 3:1 transformation ratio, assuring adequate drive from most exciters.

B1—Cooling fan (Japanese import; see photo).

C18A, B—Variable 2 section, 65 pF. per section, 0.07 inch spacing.

C19—5 section, 420 pF. per section.

K1—See text.

K2—Relay, d.p.s.t., 10A. contacts, 117v. a.c. coil.

L1—7 1/2 turns, 1 1/2 inch diameter, 2 inches long, tapped 3rd and 5th turns. Approximately 4.5 uH, total inductance, tapped at 2.4 uH, and 1.2 uH.

L2—9 turns of number 14, 5/8 inch i.d., approximately 0.8 uH.

L3—12 turns of number 14, 5/8 inch i.d., approximately 1.0 uH.

L4, L5—3 turns of number 14, 5/8 inch i.d., wound around R12 and R13 (see photo).

L6—8 turns of 5/8 inch copper tubing, 3/4 inch i.d., 2 inches long.

L7—Inductor, variable, 18 uH, maximum (E.F. Johnson 225-252).

R2, R4—Adjust for correct reading of M1 and M2.

RFC1, RFC2—4.7 uH. pigtail.

RFC3—90 uH, 500 mA. (B. & W.).

RFC4—2.5 mH., pig. wound.

RFC5—Filament choke (B. & W. FC-15).

SW1—2-gang rotary, 2 poles, 5 position.

SW2, SW4—S.p.s.t. toggle switch.

T1—Filament transformer, 117v. primary, 6.3v. 10a. secondary, c.t. (Triad F-21A).

PARALLEL A.C. CIRCUITS

A Typical Examination Question in A.C. Theory is answered in detail

LECTURE NO. 7

Parallel a.c. circuits are very widely used in radio work and it is essential to understand such circuits thoroughly.

In a great number of cases parallel a.c. circuits include series circuits within themselves and it was for this reason that series a.c. circuits were dealt with firstly.

Parallel a.c. circuits can be extremely complex so we will make this lecture a relatively simple question and work out the answers.

QUESTION

A parallel a.c. circuit consists of three branches—A, B and C.

Branch A consists of an inductance of 1 henry in series with a resistance of 100 ohms.

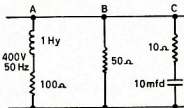
Branch B consists of a pure resistance of 50 ohms.

Branch C consists of a resistance of 10 ohms in series with a capacitance of 10 μ F.

The impressed voltage is 400 and the frequency is 50 c.p.s. (Hz.).

1. Find the individual branch impedances Z_a , Z_b , Z_c .
2. Find the individual branch currents I_a , I_b , I_c .
3. Find the impedance Z of the circuit.
4. Find the total current flowing in the circuit.
5. Find the apparent power in the circuit.
6. Find the power factor.
7. Find the true power.

Comment.—The circuit will appear like this—



Question 1:

Branch A is a series a.c. circuit containing an inductance and a resistance. From our previous lecture on a.c. circuits we remember that the formula for series impedance is:

$$Z = \sqrt{R^2 + \text{Reactance}^2}$$

Therefore

$$Z_a = \sqrt{100^2 + XL^2}$$

$$= \sqrt{100^2 + (2\pi f L)^2}$$

$$= \sqrt{100^2 + (2 \times 3.1416 \times 50 \times 1)^2}$$

$$= \sqrt{10,000 + 98,699}$$

$$= \sqrt{108,699}$$

$$= 329.6 \text{ ohms.}$$

$$Z_b = 50 \text{ ohms.}$$

Continuing the series of lectures by C. A. Cullinan, VK3AXU, at Broadcast Station 3CS for students studying for a P.M.G. Radio Operator's Certificate.

$$Z_c = \sqrt{R^2 + (XC)^2}$$

$$= \sqrt{10^2 + \left(\frac{1,000,000}{2\pi \times 50 \times 10}\right)^2}$$

$$= 318.3 \text{ ohms.}$$

Question 2:

Find the currents in each branch.

Ohms Law for a.c. is: $C = E \div Z$.

For Branch A we have

$$C = 400 \div 329.6$$

$$= 1.213 \text{ amperes.}$$

Branch B we have

$$C = 400 \div 50$$

$$= 8 \text{ amperes.}$$

Branch C we have

$$C = 400 \div 318.3$$

$$= 1.254 \text{ amperes.}$$

Question 3:

Comment.—The impedance of the circuit can be found most readily from Ohms Law.

$$\text{Impedance} = \text{Voltage} \div \text{Current.}$$

However we do not know the total current and must work out section 4 of the question before we can answer section 3.

Question 4:

Comment.—Branch A contains an inductance and a resistance, so from our previous discussions of series a.c. circuits we know that Branch A will have a positive sign, also that Branch C, being capacitively reactive will have a negative sign.

The total current will be

$$I \text{ total} = \sqrt{I_b^2 + (I_a - I_c)^2}$$

Please Note: It is common practice to interchange the letter C and I for current, particularly amongst old-timers.

$$= \sqrt{8^2 + (1.213 - 1.254)^2}$$

$$= \sqrt{8^2 + (-0.041)^2}$$

$$= \sqrt{64 + 0.000181}$$

$$= 8.00$$

As the impedance of Branches A and C are almost equal but of opposite signs, they almost cancel each other, so have virtually no effect on the circuit. For practical purposes in this circuit the small nett amount of current need not be considered.

For the question, the components in Branches A and C were selected to bring about this result as a demonstration.

Therefore the answer to section 4 of the question is:

C. A. CULLINAN,* VK3AXU

$$I \text{ total} = \sqrt{64}$$

$$= 8 \text{ amperes.}$$

Comment.—We are now in a position to answer section 3 of the question.

As stated earlier,

$$\text{Impedance} = \text{Voltage} \div \text{Current}$$

$$= 400 \div 8$$

$$\text{Answer} = 50 \text{ ohms.}$$

Question 5:

The apparent power

$$= E \times I$$

$$= 400 \times 8$$

$$= 3,200 \text{ watts.}$$

Question 6:

Comment.—The true power in a circuit is that available for work (heating, lighting, power for machinery, etc.).

$$\text{True Power} = \frac{\text{Apparent Power}}{\text{Impedance}}$$

$$= E \times I \times (R \div Z) \text{ watts,}$$

ratio $(R \div Z)$ in a right angled triangle is called the cosine of an angle or $\cos \theta$ or power factor.

Therefore Power

$$= E \times I \times \cos \theta \text{ watts.}$$

However, in this particular circuit we have determined in answer to question section 3 that the impedance is the same as the resistance, therefore the power factor is unity.

Answer to Question 6: Power factor is unity.

Question 7:

Answer.—As the power factor is unity, then the true power is the same as the apparent power.

True Power

$$= \text{Apparent Power} \times \text{PF}$$

$$= 3,200 \times 1$$

$$= 3,200 \text{ watts.}$$

ANSWERS

1. Branch Impedance

$$A = 329.6 \text{ ohms}$$

$$B = 50 \text{ ohms}$$

$$C = 318.3 \text{ ohms.}$$

2. Current in Branch

$$A = 1.213 \text{ amperes}$$

$$B = 8 \text{ amperes}$$

$$C = 1.254 \text{ amperes.}$$

3. Impedance of the circuit

$$= 50 \text{ ohms.}$$

4. Total Current flowing in the circuit

$$= 8 \text{ amperes.}$$

5. Apparent Power in the circuit

$$= 3,200 \text{ watts.}$$

6. Power Factor of the circuit

$$= \text{Unity.}$$

7. True Power in the circuit

$$= 3,200 \text{ watts.}$$

OBSERVATION

The impressed voltage is the same across each of the branches.

The current in the various branches need not be the same, but may differ considerably.

* 6 Adrian Street, Colac, Vic., 3250.

PIANO TYPE FREQUENCY METER

C. RENTON,* AX4CR

USING THE PIANO

Not being in possession of a frequency meter, I decided to try utilising the household piano to check the frequencies of the crystals as I etched them, or, to be more exact, to compare the frequencies since, of course, no note on the piano quite reaches the megacycle level!

Having some time ago also tried my hand at a spot of piano tuning, I had acquired a list of frequencies corresponding to the 85 notes of the piano keyboard.

For the etching of the crystals I purchased a 52 cent bottle of a proprietary preparation which is utilised for removing rust stains from garments and which is labelled as containing approximately 10% hydrofluoric acid (incidentally, having to sign the chemist's poison register).

The bottle is plastic, as the fluoride would attack glass (and human skin) and the fluid must be handled with care.

I poured some into a cut-down plastic pill container, the latter being in a large diameter plastic lid in case of spillage. A spring type plastic clothes peg was utilised as long to grip opposite edges of the crystal during etching.

The crystal was immersed in the solution for only a carefully timed few seconds at first to observe the rate of frequency change, the crystal being quickly rinsed in water to stop the action after each etching.

By use of a simple crystal oscillator (similar to one described in connection with an article re grinding and etching of crystals in "R.T.H." October 1963) and the communications receiver, a preliminary check revealed which of the crystals would be nearest in frequency to one another for pairing, i.e. two pairs required, with a fifth one chosen for the carrier crystal.

The station receiver was switched on some time beforehand to prevent possibility of frequency drift during the tests, the b.f.o. being on.

Two crystals were then matched for the lower pair of the filter by alternately etching the slightly lower frequency one and checking with the beat note of its mate on the receiver, care being taken that such beat notes were on the same side of zero beat.

With both crystals etched to the one beat note, the note was adjusted to coincide with a low note on the piano. In my case (from memory) the note chosen was No. 30 piano key, which was listed as having a frequency of 146.83 cycles per second.

It had been recommended that the upper pair of filter crystals be etched 1800 cycles per second above the frequency of the lower pair.

The nearest note to provide that difference in frequencies was No. 75 key, shown as having a frequency of 1975.533 cycles per second. (1975 — 146 = 1829.)

The two higher frequency crystals were then carefully etched a little at a time until the beat note on the receiver corresponded as nearly as possible with the note of piano key No. 75.

Incidentally, it did not matter that the old piano was not quite tuned up to "concert pitch," as the difference between frequencies was my only concern in this instance.

The carrier oscillator crystal, which had been on very near the frequency of the lower crystal pair, was then loaded by rubbing solder (about 1/2" diameter) on one side of the crystal to lower its frequency.

The correct procedure, I understand, is to place the carrier frequency at 20 dB. down on the lower slope or skirt of the filter crystal pass band, but not having the equipment to plot the pass-band (e.g. v.t.v.m. and r.f. probe) it was a matter of trial and (perhaps) error.

A 3-30 pF. Philips trimmer across the carrier oscillator crystal permits a slight adjustment of the frequency if required after assembly.

Jack invited me to bring the s.s.b. generator portion of the transmitter to his shack after I had completed it and his tests indicated that the crystals were satisfactory as regards pairing and frequency spacing, and that this front-end portion which included carrier oscillator, balanced modulator, crystal filter, 6BA6 amplifier and the audio portion should be okay.

The other stages of the second transmitter still await final adjustment and checking.

As a beginner, I was interested to learn that each individual stage of an s.s.b. transmitter may be tested by means of the communications receiver (only), this being useful if one stage becomes suspect. Thus, in the case of my 40 metre transmitter good signals were obtained on the receiver at the following positions, approximate frequencies being shown:

- (a) Input to v.f.o. 4 MHz.
- (b) Output of v.f.o. 12 "
- (c) Output of carrier osc. 5 "
- (d) Output of mixer 7 "
- (e) Output of 12BY7 driver 7 "

(d) and (e) also, of course, constitute checks of the audio stage.

★

FEEDBACK

The author of "Low-Cost Solid State Power Supply for Carphones and Pye Reporters," August 1970 "A.R." advises that R1 and R2 (Fig. 1) should be transposed.

Also, if the unit is slow in starting under load, put 0.1 μ F. 100v. capacitor from collector to base in each transistor.

RECENTLY I made my debut into the ranks of the "Donald Duck" brigade by constructing a 40 metre single sidebander, my junk box supplying a large proportion of the parts required, especially an old U.S. Army transmitter tuning unit which supplied the aluminium front panel, most of the remainder of the cabinet, the v.f.o. band spread condenser with its dial and reduction gear, and the final tank condenser and coil.

As I knew very little about sideband techniques when I started the above project, I desire to gratefully acknowledge the very valuable assistance given to me by Jack AX4SF, who, besides assembling portion of the gear, did the etching and checking of the crystals and alignment and testing of the finished transmitter.

Having got this transmitter on the air and having a second army transmitter tuning unit on my hands, I felt the urge to "have a go" at making another sidebander to present to a certain young Ham who was having difficulty in getting long distance contacts with his Command a.m. gear. Not wishing to impose further on the time and good nature of Jack, I decided to try to carry out this second project single handed without the use of special instruments such as Jack had.

The diagram utilised for the above transmitter is somewhat similar to that of the 5 watt one as described in "A.R." January 1967, with, however, a further stage to increase the output, i.e. a 6DQ5 in the case of No. 1 transmitter and two 807s in parallel for the second one, which was arranged for 20 metres.

A 6AU6 and half a 12AT7 were utilised in the audio stage, the other half of the 12AT7 being the carrier oscillator valve. The balanced modulator includes two diode rectifiers ex computer boards. The main components of the crystal filter circuit are four FT243 crystals and a bifilar wound coil on an annular toroid former. The output of the filter feeds into a 6BA6 amplifier, this being followed by a 6BE6 mixer stage, 12BY7 driver and a final stage as mentioned above.

The v.f.o. has only one 6AU6 valve with the output frequency a multiple of the input one.

The tone oscillator was constructed as a separate item, a tone injection point being provided on the transmitter front panel.

The crystals utilised in the carrier oscillator and crystal filter stages were the low-priced FT243 type such as have been obtainable from the W.I.A. Store at Crow's Nest. The particular ones utilised for the second transmitter were branded 4950 KHz. (those for the first transmitter being 4995 KHz.).

* 16 Wilson St., Booval, Qld., 4304.

PADDLE-YOUR OWN

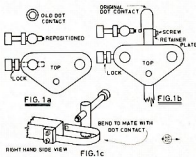
COL HARVEY,* VKIAU

The Eddystone Tear Drop Style Model 689 Semi-Auto Key, although apparently not popular as a "bug", can easily be modified to become a reliable paddle for use with an automatic keyer. An important feature is that it can also house (and shield) the solid state keyer described in "A.R." recently.

Modification is simple and involves drilling only one hole in the base plate to re-position the dot contact assembly (Fig. 1a). Modification involves:

- Removing the dot contact terminal.
- Removing the two small screws and the retainer plate which secure the spring steel dot weight assembly to the paddle.
- Removing the dot spring from the dot shaft.
- Discarding the dot buffer, the dot weights, shaft and spring.

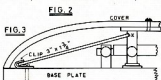
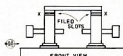
In the centre of the channel underneath the keyer base, about $\frac{1}{2}$ " from the trunnion which carries the dot travel stop, drill a clearance hole for the dot contact assembly. Make sure the contact assembly is clear of the trunnion and insulated from the base (Fig. 1a).



* 16 Leane St., Hughes, A.C.T., 2505.

Figs 1b and 1c show how to fit the topmost small screw, then the retainer plate, to the inboard end of the main assembly. Slip the end of the dot contact under the retainer plate so that the bottom screw goes through the holes in both the plate and spring contact. Adjust the position of the spring so that it can strike the re-positioned dot contact (Fig. 1b). Tighten both screws.

If two triangular slots are now filed into the front of the trunnions, near the top (Fig. 2) it will be possible to fit a matrix board or printed circuit board $3'' \times 1\frac{1}{2}''$ in the space previously occupied by the dot weights (Fig. 3). A small U shaped clip bolted into an existing threaded hole in the base secures the front of the board, which is slid into place sideways.



A few moments work connecting dot and dash contacts to the matrix board, adjusting contacts and stops, and you are ready for practice—lots of it!

CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary—not direct to "Amateur Radio".

New Equipment

WEATHER PROOF MICROPHONE

Designed specifically for marine purposes, a range of weatherproof microphones branded "Vitavox" is now available in Australia.

Type B60 series microphones are completely enclosed in a rubber case and will withstand heavy handling and total immersion in water.

They are convenient to hold in a gloved hand, and a non-locking, "press-to-talk" switch, which has relay circuit contacts fitted, can be operated through the rubber case.

A cast aluminium-alloy stowage housing is made available to provide protection for the microphone when not in use.

A technical data leaflet giving full electrical characteristics is available on request from the sole Australian agents, R. H. Cunningham Pty. Ltd., 608 Collins St., Melbourne, Vic., 3000.

ELECTRONIC KEYS



The "Ele-Key" electronic keyer will provide automatic precision code at speeds from 8 to 60 words per minute. A solid state unit, the EK26 contains 11 transistors and 12 diodes, and has a built-in, monitor oscillator, and phone jack and is fitted with a break-in QSO (vox-c.w.) terminal. Speeds are variable and can be operated semi or fully automatically.

Available in a choice of power supplies: 230 a.c. or 6 v. x 2 d.c.; total weight 3 lb. 12 oz. Price \$75 including sales tax. Further information from the Australian distributors: Bail Electronics Services, 60 Shannon St., Box Hill North, Vic., 3129.

HY-Q CRYSTALS

A new range of crystals designated the "Delta" Line, has been released by Hy-Q Electronics. They will be available in the frequency ranges of 4 to 105 MHz. (type QC6) and 10 to 105 MHz. (type QC18) and are capable of maintaining frequency over a temperature range of +5°C. to +55°C. within ± 5 parts per million (5 Hz. in every MHz.).

Full details are available from Hy-Q Electronics Pty. Ltd., 10-12 Rosella St., Frankston, Vic., 3199.

SUPPORT PROJECT AUSTRALIS!

LIMITED SUPPLY OF—

GREAT CIRCLE BEARING MAPS

60c Post Free

Printed on heavy paper 20" x 30", Great Circle Map 16" diameter. Invaluable for all DXers and S.W.I.'s. Bearings around circumference allow precise beam headings to be made.

ALL MONEY TO GO TO "W.I.A. PROJECT AUSTRALIS"

Cheques, etc., to W.I.A., P.O. Box 67, East Melbourne, Vic., 3002

WRITE NOW, WHILE STOCKS LAST

5/8th WAVELENGTH VERTICALS*

R. L. CRAWSHAW, WA0NGV

MANY articles, manuals and even full-length books are devoted to antennas in general and as specifically applicable to the Amateur Radio service. Unfortunately, one of the most effective simple antennas for both local ground wave and long haul DX communications on the higher frequency bands is almost invariably conspicuous by its absence. Consequently, few Amateurs are familiar with the characteristics, design, or construction of the 5/8 wavelength vertical antenna.

It will be immediately apparent to most Amateurs that the 5/8 wavelength vertical antenna will provide an omnidirectional radiation pattern and a vertical polarised signal. And the antenna itself will be $2\frac{1}{2}$ times as tall as the more familiar $1/4$ wavelength vertical or groundplane. What will not be so obvious, to the uninitiated, is the even lower angle of vertical radiation, the gain obtainable and an additional improvement in reception due to increased capture area over the conventional $1/4$ wavelength antenna.

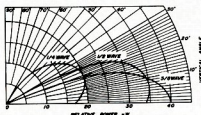


Fig. 1—Low-angle radiation increases as antenna length increases up to $5/8$ wavelength.

These characteristics have made the 5/8 wavelength antenna very popular in the land mobile services and in Amateur 2 metre f.m. operations where omnidirectional vertically polarised ground-wave communications with low power mobile stations are desired on a full-time basis.

Vertical antennas, almost invariably of the $1/4$ wavelength variety, have been widely employed in the Amateur Radio service for DX communications where their low angle of radiation (assuming an adequate ground system) has proved very effective. Since the polarisation of radio signals is generally reflected significantly in the process of reflection, cross-polarisation losses are seldom consideration in sky-wave communications.

Unfortunately, the additional advantages of the 5/8 wavelength antenna

have seldom been employed for normal Amateur communications. True, a 150 ft. vertical for 75 metres or 80 ft. for 40 metres is beyond the facilities of most Amateurs. However, a 30 ft. antenna for 15 metres is well within Amateur capability, and 50 ft. (20 metres) is within the realm of reason.

THEORY OF OPERATION

As a short grounded vertical antenna is increased in length, the radiation lobe narrows, increases in tensi, and the angle of max. radiation lowers toward the horizon. As the length exceeds half wavelength, a secondary lobe of radiation at high vertical angles develops; but the low-angle radiation continues to increase until a height of $5/8$ wavelength is reached (Fig. 1). With no equalising factor, as the length is increased beyond $5/8$ wavelength, the high-angle radiation increases and the low-angle radiation decreases.

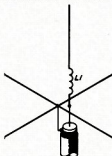


Fig. 2— $5/8$ wavelength vertical base-loaded to $5/8$ wavelength with series inductance.

Since the $5/8$ wavelength antenna is non-resonant, it presents highly reactive load impedance unsuitable for direct feeding. At least three basic methods are available to transform this impedance to a 50 ohm non-reactive feedpoint.

Probably the simplest method is the use of a small series inductance as shown schematically in Fig. 2. The inductance can be considered as base loading the antenna to $3/4$ wavelength (with no change in the radiation pattern). This is a resonant length which will present a feedpoint resistance of approximately 50 ohms, a very close match to RG-8/U or CG-58/U co-axial cable. Adjustments to the loading coil should provide an s.w.r. of less than 1.2:1.

In the groundplane configuration, some additional improvement in s.w.r. can be obtained by dropping the radials. Approximately 30° below the horizontal will be about optimum with a resulting s.w.r. of less than 1.1:1. This configuration has the advantage in simplicity and ease of construction and tuning. It will also be relatively broadband when fabricated of materials of adequate strength.

The second feed method utilises a parallel-resonant circuit tuned to the operational frequency with the feedpoint tapped at a low impedance point on the coil, as shown in Fig. 3. This arrangement may be considered as providing high impedance feed to the base of the radiating element and a

direct ground connection to minimise ignition noise and provide a degree of lightning protection. Co-axial feedpoint tap adjustments in conjunction with minor tuning changes can provide nearly a 1:1 s.w.r. at the operating frequency.

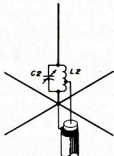


Fig. 3— $5/8$ wavelength vertical using parallel tuned circuit feed.

The tap point and tuning adjustment interact slightly and initial adjustments are slightly more time-consuming. However, the coil-capacitor combination can be grid-dipped to the approximate frequency on the bench so that only minor touch-up is required.

This configuration has the additional advantages of providing a very low s.w.r. without decoupling-radial droop or when mounted on a mobile installation. It will not normally be quite as broadband as the first.

A third method of feeding is through the familiar gamma match, as shown in Fig. 4. Here the radiator itself is grounded and the feedline is tapped onto the radiator through a series capacitance. This arrangement also provides a direct ground connection for

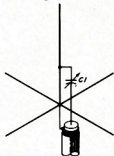


Fig. 4— $5/8$ wavelength grounded vertical with gamma match feed.

minimisation of ignition noise and a reasonable degree of lightning protection. Feedpoint tap variations combined with series capacitor adjustments can provide nearly a 1.0:1 s.w.r. at the operating frequency.

This configuration is particularly adaptable to feeding existing grounded towers as ground system of heavy radials will be required.

DESIGN

The $5/8$ wavelength vertical radiator should be reasonably close to a full $5/8$ wavelength at the desired frequency but should preferably be no longer.

(Continued next page)

* Reprinted from "73 Magazine," May 1970.

Consequently, the decoupling radials should be a 5/8 wavelength at the high end of the band of operation. Conversely, the decoupling radials should be a minimum of 1/4 wavelength at the low end of the operating band. The following formulae are based on reasonable velocity factors for materials probably available in Amateur construction and should prove adequate for preliminary design purposes.

Radiator length (inches)
= $7020 \div f$ in MHz., or

Radiator length (feet)
= $585 \div f$ in MHz.

Decoupling radial length (inches)
= $2880 \div f$ in MHz., or

Decoupling radial length (feet)
= $240 \div f$ in MHz.

Using these dimensions, the coupling circuit can then be selected to resonate or provide minimum s.w.r. at the desired operating frequency. Though theoretically any coil or coil-capacitor combination which can be resonated at the desired frequency would work, it is important that good tank-circuit design principles and full weather protection be considered to minimise circuit losses and provide for maximum energy transfer. In general, this implies that all coils be space-wound with large wire or tubing and that length-to-diameter ratios be less than 4:1 (and preferably 2:1). Capacitors should be high quality, ceramic insulated or wide air-spaced variables for ease of circuit adjustment and reasonable power handling capability.

The co-axial feed tap point will vary with different constructional methods and materials, and the optimum point must be determined experimentally for each installation. It will invariably be quite close to the ground end of the coil, varying from approximately 1 turn on 2 metres to possibly 3 or 4 turns on 20 metres.

CONSTRUCTION

While this is not intended as a "hardware" style construction article, a few approaches possibly worthy of further consideration have been accumulated.

Conventional t.v. masting or aluminium tubing is readily available, rugged and inexpensive, although insulation and installation are more difficult than with some other materials.

Of course, the surplus plus antenna segments and their matching insulators are relatively inexpensive, free standing to heights approaching 20 feet; they are relatively light in weight and are available from numerous sources.

Insulated (or even grounded) antenna towers should make effective radiators for the lower frequency bands, providing an adequate ground radial system is incorporated.

On 2 metres or even 6 metres, a fibre-glass fishing pole covered with shield braid from RG-8/U and RG-58/U makes an ideal radiator. Of course, 1/8 inch welding rod works adequately on 2 metres or higher bands also.

Although this antenna will probably not compete with a good beam or quad at optimum elevations above ground, it is a very effective antenna, readily and economically fabricated with minimum facilities.

HOME-BREW FIVE-BAND LINEAR AMPLIFIER

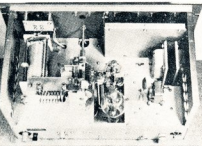
(Continued from Page 9)

ACCESSORIES

The fluted knobs and nickel-silver dial may look old fashioned, but I like them. They're still available commercially. The dial pointer was lost years ago, so I made one from a scrap of plastic. The pinch drive provides just enough drag to keep the tuning capacitor from getting out of adjustment.

The metres, are surplus items. Their sensitivity wasn't what I wanted, but this was corrected using standard techniques.

The roller-coil dial is home-made. I bought a 3-digit counter from a surplus dealer for a dollar. The metre gears were obtained from a standard right-angle drive. I cut the escutcheon from 1/8 inch thick sheet aluminium. It is finished in black-wrinkle lacquer. A possible source of wrinkle finishes in spray cans is your neighbourhood Speed Shop; the hot-rod set seems to favour these finishes nowadays.



Top view of the Linear Amplifier.

DECALS

You'll want to label your controls and other accessories. I prefer the water-type decals to the dry transfer labels because mistakes are easier to correct. With the latter, you're committed to a position on the panel, and it is difficult to remove dry transfers without ruining the finish. After you have positioned the decals, spray them with clear lacquer.

A FINAL WORD

If this is one of your first major construction projects, and you have made a few mistakes in mechanical work, all is not lost. Most goofs can be remedied. Extra holes can be occupied with screws and solder lugs, as if this is what you intended all along. Or you can strip the finish and fill the hole with auto-body solder, then re-finish the panel. This takes a few hours of extra work, but it reflects your pride in a job well done.

¹ "The Radio Amateur's Handbook," 46th edition, 1969, American Radio Relay League, p. 328.

FED. PRESIDENT'S TOUR

The Federal President, Michael Owen, VK3KI, has returned from his overseas tour which covered discussion on matters affecting the 1971 Space Frequency Conference, I.A.R.U., and Region III.

Subsequent issues will cover the points of interest to members in his discussions with Amateur Societies in the Far East, U.S.A. and Europe.

The following letter was received from the Secretary of the I.A.R.U. Region I. Division:

Secretary, W.I.A.,
Although writing on I.A.R.U. notebook, I am also speaking for the R.S.G.B.

It is felt by the Council, and particularly by those persons who had the opportunity to meet Michael, that the visit of your President was a most valuable opportunity to discuss many matters of mutual interest. We feel that the W.I.A. are to be congratulated on their foresight in persuading their President to make the arduous journey.

As you know, he had the opportunity of meeting the leader of the U.K. delegation to the Space Conference. As a final development, the Ministry of P. & T. have now given me a brief wording of the proposal to be made at the W.A.R.C. I enclose a copy of this for your information.

Yours sincerely,

R. F. Stevens, G2BVN.

MORSE TAPE SERVICE

There is a Morse Tape Service available to anyone whether a member of the W.I.A. or not from the VK2 Division of the W.I.A. The cost of the service is 30 cents per tape and the loan period is set at two months. There is also a charge of 15 cents for tape overdue beyond the two-month period. Payment of either amount is preferred by either stamps or postal notes made out in favour of the W.I.A. N.S.W. Division.

To save time when applying it would be appreciated if the following information could be supplied in the application:

- (1) Name of tape recorder.
- (2) Number of tracks.
- (3) Maximum size of tape spool used.
- (4) Speeds at which it plays.
- (5) Which tape shown in the list below that you require. It is normal for only one tape to be supplied at a time.

The majority of the tapes available are on 5" spools, two-track at a speed of 3 1/2 i.p.s. There are also some tapes on 3" spools at 3 1/2 i.p.s. and 1 1/2 i.p.s.

The tapes available from the service are:

- Special for beginners (50 minutes).
- | | | |
|--------|-----------------|----------------|
| No. 1: | 1 hr. 5 w.p.m., | 1 hr. 6 w.p.m. |
| No. 2: | " 7 " | " 8 " |
| No. 3: | " 10 " | " 11 " |
| No. 4: | " 12 " | " 14 " |
| No. 5: | " 15 " | " 16 " |
| No. 6: | " 18 " | " " |
| No. 7: | " 20 " | " " |

For the supply of tapes or for further information contact the Morse Tape Supervisor, Max Francis, VK2BMK, 93 Kingdon St., Scone, N.S.W., 2337.

READING THE PREDICTION CHARTS

To use these charts, ability to read a graph is the basic requirement. The curve marked M is the maximum useable frequency and in normal propagation, communication by a frequency above the MUF curve is not possible between Canberra and the location shown at the top of the graph. Similarly, the curve marked A is the absorption limiting frequency and frequencies below that line are completely absorbed.

If, for example, the area between the MUF and ALF curve covers 28, 21, 14 and 7 MHz., communication will be possible on all four bands, but signals will become weaker as the frequency decreases and could be below the noise level in a particular area on 7 MHz.

Should the ALF curve cross and become higher in frequency than the MUF curve, then no communication is possible by means of F layer reflection.

Anomalous propagation does occur, but a number of factors can cause this to happen, and at times, prove predictions to be wrong.

To permanently expect to operate at the MUF is "dangerous living" and we use what is known as the optimum working frequency, OWF, which is 15% below the MUF. The F layer never

remains constant and varies from day to day, which means if you operate right on the MUF curve you will have times when, due to the MUF falling below the predicted frequency, the band is closed. Similarly, the band could open when not predicted. This is why it is best to use the OWF in working as against the MUF.

To give you an example of reading the chart, I will use the September '70 chart of the long path, Canberra to Montreal.

At 0001 GMT or Z time, the ALF curve passes through 12 MHz., which means as 7 MHz. is below that curve, 7 MHz. is completely absorbed. The MUF curve at the same time is 22 MHz. which means any frequency above 22 MHz. is unusable, so between the MUF and ALF curve at that time it will show 21 and 14 MHz. to be open.

The MUF curve continuously drops until by 0100z, 21 MHz. has closed, leaving 14 MHz. as the only workable band. At 0530z the MUF curve crosses the 14 MHz. line, which then means 14 MHz. is closed, so that there is no Amateur frequency open to Montreal by long route.

In the meantime the ALF has increased in frequency until at 0700z, it passes through 14 MHz., so even if the MUF curve was above 14 MHz., that band would not be open and this actually does take place at almost 0900z, when the MUF curve goes above 14 MHz. but the ALF curve remains above 14 MHz. until 1500z. So with the MUF curve above and the ALF below 14 MHz., that band will be open at 1500z. However, it again closes at almost 1700z when the MUF curve goes below 14 MHz. and it stays closed until 2300z.

So summing up, 21 MHz. is open 2200z to almost 0100z and 14 MHz. 2100z to 0530z and 1500 to 1700z. If the ALF were to drop 1 MHz. at 2130z, then 7 MHz. would open briefly. Similarly, if the MUF were to rise a little over 1 MHz. at 1100z, then 21 MHz. would have a brief opening.

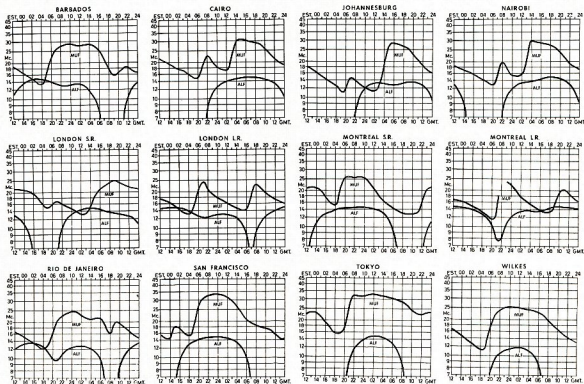
Always remember, the F layer never remains constant, so the MUF can change daily. So can the ALF, but to a far less degree.

If you are able to borrow a copy of "A.R." for January 1967, further information can be obtained from a much more extensive article on this subject.

—F. T. Hine, VK2QL.

PREDICTION CHARTS FOR SEPTEMBER 1970

(Prediction Charts by courtesy of Ionospheric Prediction Service)



Wagga Wagga Centenary and South-West Area Convention

SOUTH-WEST AREA BI-CENTENARY CERTIFICATE

An attractive certificate will be issued by the South-West Area to any station who works seven or more stations in the South-West Area (Area 5).

1. The contact can be on any band or any mode.

2. The stations worked can be any part of the South-West Area.

3. Commences on 15th August, 1970, at 0001 hours A.E.S.T. and finishes on 5th October, 1970 the last day of the Centenary Convention at Wagga.

For those who are not sure, these towns and their environs are in the South-West Area: Wagga Wagga, Albury, Griffith, Narandera, Leeton, Tumut, Tumbarumba, Batlow, Deniliquin, Temora, and Gong Gong.

4. Show all particulars on the log sheets and submit them to the Secretary of the Wagga District Radio Club, 105 Ashmont Ave., Ashmont, Wagga, 2650.

S.w.'s are invited to submit log sheets for contacts heard, with at least one station in the South-West Area, per contact. Seven contacts are required also.

Bookings can be made through the Club Secretary, I. A. McKenzie, VK3ZLU, 106 Ashmont Ave., Ashmont, Wagga, 2650. The deposit required is two dollars per person per night. Confirmation will be given by return mail. The motto for accommodation is "be early and all will be right."

WAGGA CENTENARY TROPHY

Radio Amateurs throughout the Commonwealth of Australia are invited to compete for a suitably inscribed trophy donated by the Lord Mayor and the Wagga City Council, as a part of the Wagga Wagga City Celebrations, for the 100 years of local government.

The trophy will be awarded to the station who works the most call signs of Wagga Amateurs, during a period of nine days commencing 12th September, 1970, at 0001 hours A.E.S.T. and finishing 20th September, 1970, at 2359 hours A.E.S.T.

RULES

1. Bands used will be 80, 40 and 20 metres.
2. Modes: AM, SSB or CW.
3. Station who works the highest number of Wagga contacts is declared the winner.
4. Any call sign in Wagga can only be worked once in one 24-hour period (0001-2400).
5. A call sign can be worked in the same 24-hour period on another band.
6. Signal report and contact number is required to be exchanged and recorded in log sheets, e.g. 50001.
7. Log sheets have to be submitted so as to be in the hands of the Secretary of the Wagga District Radio Club by 26th September, 1970. No late entries will be accepted.
8. The winner will be announced at the Wagga Centenary South-West Zone Convention Dinner and also in the N.S.W. Bulletin.

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

GRAPHICAL SYMBOLS FOR USE IN ELECTROTECHNOLOGY—DRAFT STANDARD

The Standards Association of Australia is seeking comment on draft Australian standard graphical symbols for use in electrotechnology, applying in particular to semiconductor devices. The draft is issued for public review as Doc. 1579.

The Draft is based on an International Electrotechnical Commission recommendation for symbols, and the terminology is consistent with the International Electrotechnical Vocabulary. This will facilitate the exchange of information on equipment using semiconductor devices.

Doc. 1579 applies to graphical symbols for use in circuit diagrams. It establishes a number of basic elements and demonstrates a method of combining these elements to produce complete devices. Symbols may be combined to produce more complex or more descriptive symbols, or both. The principles governing the combining of these various symbols are specified.

Qualifying symbols indicating a special function or property essential for operation of the circuit containing the device are defined and examples given of their use. Reference designations are shown for discrete devices.

Copies of Doc. 1579 may be obtained, without charge, from the various offices of the Standards Association of Australia in all capital cities and Newcastle.

Comment on the provisions of the draft is invited from persons or organisations experienced in the application of such symbols in their field of work. Such comment should reach the head office of the Association, 80 Arthur St., North Sydney, N.S.W., 2060, or any branch office, not later than 30th September, 1970.

This Convention will be held over the Eight-Hour Week-end: Saturday, 28th October; Sunday, 29th October; and Monday, 30th October. The location will be in the Wagga City area.

Programme.—Saturday: Arrival and registration, tours of city, Centenary Show (Wagga Show Society). Strangers will be met and directed to the registration centre. Net frequencies for Mobs will be: 40 m—7110 KHz, 6 m—52.525 MHz. (FM), 2 m—146.000 MHz. (FM) (all day Saturday).

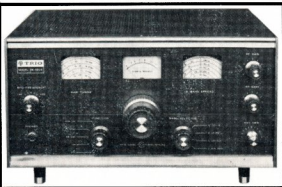
Saturday night: Dinner to commence at 7 p.m. Slides afterwards for those interested.

Sunday: 9 a.m., meet at Belconn Park in Tarcutta St. Guides from there on to site. 10 a.m., welcome and ragchew. 11 a.m., hidden transmitter hunt on 146 MHz FM. Novelty competitions for YLs, XYLs and Harmonies (scavenger hunts, etc.). 12.30 p.m., Barbecue (big one). 1.30 p.m., varied novelty events for all, events for S.w.'s. 2 p.m., 40 m all-band scramble, 2 m all-band scramble (146 MHz); separate prizes for 40 and 2 m. 2.30 p.m., pedestrian hunt of varied nature on 2 m FM for all ranks (146 MHz). 3.15 p.m., fox hunt on 2 m FM (146 MHz). 4.30 p.m., presentation of prizes, results of competitions. 7.30 p.m., auction at half 10 per cent for organisation, bring all your unwanted(s). Get-together and other entertainment for others.

Monday: 10 a.m., meet at Tarcutta St. again for a visit to various but interesting organisations in Wagga. To end up at a picnic barbecue, at a take-off point for people to leave from.

Accommodation.—The Wagga District Radio Club has a motel accommodation tentatively booked, which can be, under difficulty, held up to the 12th Sept., after that we cannot guarantee accommodation as the Wagga Centenary Show will be on the same week-end. So please book early.

TRIO
9R-
59DS



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- 4 BANDS COVERING 540 Kcs. TO 30 Mcs.
- TWO MECHANICAL FILTERS ENSURE MAXIMUM SELECTIVITY.
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Sydney. Phone: 40 1212

WORKED ALL VK CALL AREAS (W.A.V.K.C.A.) AWARD

OBJECTS

1. This Award, to be known as the W.A.V.K.C.A. Award, is offered by the Wireless Institute of Australia as tangible evidence of the proficiency of overseas Amateurs in making contacts with the various call areas of the Commonwealth of Australia.
2. The Award may be claimed by any Amateur in the world who is a member of an affiliated Society of the I.A.R.U., but no Australian Amateur will be eligible.

REQUIREMENTS

- 2.1 A handsome Certificate will be awarded to any applicant who makes contacts with Australian Amateur Stations in the areas shown in the attached Appendix. The number of contacts required in each area is also shown.

OPERATION

- 3.1 Contacts between overseas stations and Australian stations must have been made on or after the 1st January, 1940.
- 3.2 Contacts may be made using any authorized frequency band or type of emission permitted to Australian Amateurs, but cross band contacts will not be allowed.
- 3.3 No contacts made with ship or aircraft stations in Australian territories will be eligible, but land-mobile or portable stations may be contacted provided the location at the time of contact is shown on the confirmation.

VERIFICATIONS

- 4.1 The applicant must submit documentary proof, in the form of QSL cards or other written evidence, confirming that two-way contacts have taken place. Such verifications must show the date and time of contact, type of emission and frequency used, signal reports and location (in the case of portable or land-mobile operation) of the stations contacted.

- 4.2 Verifications must be submitted exactly as received, and forged or altered evidence must result in the disqualification of the station concerned.
- 4.3 A list, in accordance with the details required in Rule 4.1, must be submitted with the application for the Award.

APPLICATIONS

- 5.1 All claims for the W.A.V.K.C.A. Award must be made by the submission of the confirmations (Rule 2.1), together with the list (Rule 4.3), direct to "Awards Manager," P.O. Box 97, East Melbourne, Victoria, 3002, Australia. Sufficient International Reply Coupons must be enclosed to cover return postage of the confirmations to the applicant.
- 5.2 Where a reciprocal agreement exists between the W.I.A. and the applicant's Society, the appointed officer of that Society will carry out the check, and if correct, will forward a written application for the Award on behalf of the applicant, together with the list (Rule 4.3).
- 5.3 Applications will be examined by the Awards Manager, who will arrange for the Award to be forwarded either direct or through the applicant's Society. The Awards Manager's decision on the application and interpretation of these Rules will be final and binding.
- 5.4 Notwithstanding anything in the Rules to the contrary, the Federal Council of the W.I.A. reserves the right to amend these Rules as necessary.

APPENDIX

Territory	Call Area	QSLs Required
Australian Antarctica		
Heard Island		VK0 1
Macquarie Island		
Australian Capital Territory		VK1 1
Lord Howe Island		VK2 3
State of New South Wales		
State of Victoria		VK3 3
State of Queensland		VK4 3
Thursday Island		
Willis Island		VK5 3
State of South Australia		
State of Western Australia		VK0 3
Flinders Island		VK7 3
King Island		
State of Tasmania		
Northern Territory		VK0 1
Admiralty Islands		VK9 1
Bougainville Island		
Christmas Island		
Cocos Islands		
Nauru (VK9 only)		
New Guinea		
New Ireland		
Norfolk Island		
Papua Territory		

Note.—In Areas above, where more than one confirmation is required, contacts may be made with any or all of the Territories listed in brackets.

NEW CALL SIGNS

APRIL 1970

- VK3GE—M. G. Dutton, 75 Terry Rd., Eastwood, 2122.
- VK3AE—W. A. Easterling, 279 Forest Rd., Waverley, 2228.
- VK3ALM—V. J. McKeercher, 42 Alenax Ave., Dundas, 2117.
- VK3BA—A. A. Brewgen, 31 Oakland Ave., Windang, 2503.
- VK2BJH—G. J. Griffiths, Station: Bellinbopini, via Kempsey; Postal: 21 Neville Eversen St., Kempsey, 2440.
- VK32JH—G. J. Merrill, 6 Bungowen Ave., Thornleigh, 2126.
- VK22VJ—E. Brown-Sarre, Silver City H'way, Buronga, 2648.
- VK3FP—C. Reisinger, 69 Noble St., Noble Park, 3174.
- VK3UO—J. C. Chippindall, 29 Waverley Pde., Pascoe Vale, 3944.
- VK3AEF—M. B. Bywaters, 30 Queen St., Nhill, 3418.
- VK3AOH—W. R. Hempel, 9 James St., Kyabram, 3626.
- VK3AK—K. H. King, 15 Stonehaven Cres., Moorabbin, 3188.
- VK3BBY—Shepparton South Technical School Radio Club, Wilmot Rd., Shepparton, 3639.
- VK3BCG—Camberwell Grammar Radio Club, 55 Mont Albert Rd., Canterbury, 3126.
- VK3BCP—R. M. Trott, 137 Bignell Rd., East Bentleigh, 3163.
- VK3BCT—R. D. Trickett, 8 Yinnar St., Broadmeadows, 3047.
- VK3BCY—W. H. M. Hoyle, 45 Turana St., Doncaster, 3180.
- VK3BDL—R. M. Garratt, 30 McGregor St., Fairfield, 3078.
- VK3BDL—A. M. Goode, 92 Mont Albert Rd., Canterbury, 3126.
- VK3BDS—R. H. Williams, 3 Westbourne Gr., Camberwell, 3124.
- VK3BDV—H. J. Hook, 145 Miller St., North Fitzroy, 3058.
- VK3BGW—W. G. Baird, 23 Landale St., Box Hill, 3128.
- VK3YAO—R. J. Payne, Flat 10, 83 Cleeland St., Sandenong, 3179.
- VK3YBI—H. N. Ronchetti, 4 Finlayson Cres., Traralgon, 3844.
- VK3YCI—R. H. Thompson, 65 Doncaster Rd., Mitcham, 3122.

- VK3YCI—J. E. S. Day, 35 Mount St., Glen Waverley, 3150.
- VK3YCM—B. F. Sunderland, 2 Grifton St., Coburg, 305.
- VK3YDA—J. J. Conrad, 8 Allambie Ave., Camberwell, 3124.
- VK3YDB—G. N. Long, Eyre Rd., Mt. Dandenong, 3121.
- VK3YDC—R. J. Paynting, Flat 10, 39 Somerset St., Richmond, 3121.
- VK3YDM—M. J. Dawkins, 14 Springvale Rd., Ringwood, 3131.
- VK3YDS—G. J. Payne, 97 Ringwood St., Ringwood, 3134.
- VK3YDX—C. Pandolfo, 35 Clifton St., Richmond, 3121.
- VK3YEF—M. R. Hammer, 285 Bay Rd., Cheltenham, 3192.
- VK3ZHX—R. E. Jones, 2 Laird St., Croydon, 3136.
- VK3ZRL—R. W. Nash, Glenusee St., Point Lonsdale, 3225.
- VK3ZTJ—P. D. McKenzie, 10 Homer Ave., Croydon, 3136.
- VK4CS—J. McDonald, Flat 1, Tallaringa, 8 James St., Currumbin Beach, 4228.
- VK4DT—J. H. Ginsberg, Eton Private Hotel, Adelaide and Wharf Sts., Brisbane, 4008.
- VK4LQ—L. J. Jones, 24 Leslie St., Toowoomba, 4350.
- VK4LY—L. A. Dancy, 8 Warren Cr., Aitkenvale, 4814.
- VK5AZ—B. T. Parker, 10 Regent St., Pennington, 5007.
- VK5LL—G. Douglas, 123 Flinders Tce., Port Augusta, 5700.
- VK5PK—P. Kwart, 6 The Grove, Dulwich, 5065.
- VK5W—W. O. B. Wilson, C/o R. Sedunary, Campbell Ave., Crafers, 5152.
- VK5ZES—E. L. Smith, Flat 2, 11 Hawson Pl., Port Lincoln, 5600.
- VK5ZHE—H. Dilloff, 22 Parkmore Ave., Sturt, 5047.
- VK5ZR—A. R. Holker, 80 Mainwaring Cres., Elizabeth Field, 5113.
- VK5ZZI—D. W. Friend, 84 Northgate St., Unley Park, 5081.
- VK6CK—C. M. Hayes, 42 Brentwood Ave., Woodlands, 6018.
- VK6RW—R. J. Woot, Station: Mingenew, 6522; Postal: C/o Cassarina Enterprises Pty. Ltd., P.O. Box 87, Mingenew, 6522.
- VK6SR—Southern Electronics Group, Blue Water, The Esplanade, Little Grove, Albany, 6330.

- VK6ZAG—A. M. Gath, Station: Cuballing, 6311; Postal: P.O. Box 29, Cuballing, 6311.
- VK6ZAY—C. F. Muller, 128 Gladstone Rd., Melbourne, 613.
- VK6ZGN—R. E. Good, 237 Gloucester St., Victoria Park, 6100.
- VK6ZGV—M. B. Harris, 4 Hough Rd., Attadale, 6155.
- VK6ZGX—J. A. Cunningham, 13 Boronia Cres., City Beach, 6015.
- VK7LH—R. Hiller, 143 Gunn St., Devonport, 7310.
- VK7M—Kings Meadows High School Radio Club, Guy St., Launceston, 7250.
- VK8KN—R. W. H. B. Jones, Station: Portlisle; Postal: 14 Brown St., Alice Springs, 5750.
- VK8ZQ—R. J. Sieber, 28 Lindsay Ave., Alice Springs, 5750.
- VK9J—R. J. Gray, Boundary Rd., Lae, N.G.
- VK9JJ—J. J. Schaf, (Rev.), Station: Bundralis Manus Island; Postal: Catholic Mission, Bundralis P.O., Lorengau, Manus Island.

CANCELLATIONS

- VK1BX—M. C. Hooper. Transferred to Vic.
- VK2AXG—Kisma High School Radio Club. Not renewed.
- VK2BCG—A. Cruickshank. Not renewed.
- VK2BJJ—J. P. Meehan. Not renewed.
- VK2BPK—R. Halpin. Not renewed.
- VK2BRW—W. R. Beveridge. Not renewed.
- VK3CH—A. G. Nunn. Not renewed.
- VK3JU—J. C. Chippindall. Not renewed.
- VK3JEF—Eighty Footers Boy Scouts' Amateur Radio Club. Not renewed.
- VK3AEM—H. E. Mitchell. Now VK3JX.
- VK3AYK—K. F. Price. Not renewed.
- VK3BPK—K. H. King. Now VK3AK.
- VK3ZAR—A. Key-Kravchenko. Not renewed.
- VK3ZCJ—G. G. Baker. Transferred to N.T.
- VK3ZOD—G. N. Payne. Now VK3YAO.
- VK3ZBR—C. Reisinger. Now VK3FP.
- VK3ZUK—B. K. Freer. Not renewed.
- VK3ZXR—J. E. Rising. Not renewed.
- VK3ZY—A. M. Goode. Now VK3BDL.
- VK4WG—W. G. G. Clayton. Not renewed.
- VK5DQ—K. J. Horan. Transferred to Vic.
- VK5DPA—R. J. Parker. Now VK3AZ.
- VK5ZLL—L. G. Douglas. Now VK5LL.
- VK6ZAT—B. J. Jacobs. Not renewed.
- VK8ZCE—R. J. Sieber. Now VK8ZQ.

Overseas Magazine Review

Compiled by Syd Clark, VK3ASC

"BREAK-IN"

June 1970—

Digital Frequency Counter, ZL3BGP, Part 1. This article describes the theory of operation of frequency counters and describes the construction of a unit suited to Amateur uses which is composed almost entirely of integrated circuits.

Did You Get That Country Confirmed, ZM2AFZ. For those people who send more cards than they receive.

A ZL in JA, ZM2CD. Describes the experiences of the NZ.A.R.T. President in Japan.

Single Sideband Exciter 9 MHz. Phasing Type, ZL4LV. Part 2. Continues the description of this equipment. Circuits, parts lists, board layouts, etc.

Decibels, ZL2NK. Many newcomers to Electronics find it hard to understand Bel and Decibels. Mr. K. G. Johnson explains.

"CO T.V."

May 1970—

Published by the British Amateur Television Club.

Modern Video Mixer, by G8ARV and G8SDBT.

Notebook No. 4, An IC Timing Generator for SSB Scan.

How to Make Yourself a Cheap and Cheerful Delay Line, G8SDBT and G8ARV. Australian Amateurs interested in T.V. experiments may wish to become members of the B.A.T.C., 64 Showell Lane, Penn, Wolverhampton, Staffs, England.

"OHM" The Oriental Ham Magazine

April 1970—

As a rule this publication does not seek to outdo "QST", "CQ", "73", or other U.S. magazines in technical content, in fact there are often no technical articles at all. It is published in Hong Kong. (The writer has visited Hong Kong twice during 1969 for about an hour each time and can only describe the landing of the aircraft at Kai Tak as "Breath-taking... those hills appear to be very close to the wing tips!) The publishers of "OHM" can usually be relied upon for some interesting news from their area and this month "Return to Corregidor" is described. Descriptions of history will remember that the last stand of the American Far Eastern Forces was made at Corregidor in 1942 and that General Douglas MacArthur escaped to Australia by P.T. boat and strongly influenced the conduct of the war against the Japanese.

"QST"

June 1970—

A Digital Morse Code Message Generator, K1PLP. Described by the author as a c.w. identifier that can be set up to send a button and the box automatically sends CQ plus your call, plus the standby K, in absolutely perfect code. Or it can be set up to send a complete contest exchange or for a repeater identifier. Cost, in the U.S.A., less than \$65.

Building a Simple Two-Band V.F.O., W1CER. Describes in a follow-up article to the Feb. design article that appeared in last month's "QST," a solid state V.F.O. for 3.5 or 7 MHz.

How to Handle Hi-Fi Interference, W1CIP. New problems take the place of old and as "hi-fi" equipment spreads across the country more and more Amateurs can expect to receive complaints from neighbours who have purchased expensive audio equipment. There is no single solution to the problem and some of the techniques for curing interference are described.

The Portable/Mobile Microphone, W1K1K. This article reviews the basics of microphones, contains information on adapting military surplus noise-cancelling audio equipment. There are also shown how to construct carbon and magnetic hand-held mikes from inexpensive telephone elements.

Let's Talk Transmitters, Part 8, Odds and Ends. A closer look at power dissipation, leakage current and current amplification.

A 10-MHz Mobile Whip, W42HMM. By using a shunt circuit resonant circuit by the use of the six metre element it is effectively isolated from

the ten metre section during six metre operation. A similar technique can be used on other bands if desired, mechanical problems will be a little harder.

V.I.G. Mobile Whips, W1HDP. Take some PL259 plugs, some transistor radio or car radio whips and a few odds and ends and your new mobile antenna can soon be completed.

Slow Scan T.V. Viewing Aerial for Oscilloscopes, W1FEN. This article describes a simple adaptor to convert popular oscilloscopes to slow scan monitors.

A Bonus to the Public, W3KMW/WAGKH. Statisticians that our hobby must operate in the public interest to justify its existence are not new to Amateurs. We've been providing public service communications, keeping technically alert and contributing towards advances for many years.

Field Day Verticals Versus Tags, W5EQ. A humorous article with some pros and cons of one of the old arguments.

"RADIO ZS"

April 1970—

A Versatile Monitor, ZS1MM. A useful gadget for measuring field strength or indicating when a transmitter is on air by means of a moving coil meter.

Introduction to and Theory of Hall Effect, ZSSD. This effect was discovered by E. H. Hall at John Hopkins University in the U.S.A. in 1879. Due to the lack of suitable materials from which to obtain useable voltages, its application had to await the development of suitable semiconductor materials for it to gain wide acceptance in scientific circles. It is mostly used for the measurement of magnetic fields.

Simple Half Power Circuit, ZSHHF. Place a silicon diode across a single pole switch in series with your resistive load and the r.m.s. power is halved when the switch is open. Very useful for maintaining a soldering iron without overheating.

What About the Receiver, ZSSD. A humorous story about receiver ailments and particularly about Miller Effect.

Simple "No Holes" Mobile Mount, VK3ASC. Reprinted from "A.R."

New Approach to Multi-band Beam Design, G2HGC. Reprint from "S.W. Mag."

Those Good Old Days, ZSSJC. Spark bit (not transistors).

The Bag Rules a Nautical Type, ZS102. One for the S.W.'s.

May 1970—

C.H.C.—What Does It Stand For, ZS1ACD/CHC201. The Certificate Hunters' Club members will already know all about it.

The I.V.S. Power Supply, ZSHHF. The author claims that a power supply for an s.b.b. rig requiring say 300 mA. peak can be built from a transformer capable of about 25 per cent. of that power, i.e. 75 mA. continuous. If the same power supply is to be used for a transmitter it may need to be rated a little more liberally and if you want to use it for something like a T.R.F. rig, the power supply will need a continuous rating which is much nearer unity.

Loading Made Easy, ZS6ACK. Describes methods of making it easy to properly load a transmitter. Certain simple tuning aids are described.

Wireless Institute of Australia

Victorian Division

A.O.C.P. CLASS

commences

MONDAY, 7th SEPT., 1970

Theory is held on Monday evenings from 8 to 10 p.m.

Persons desirous of being enrolled should communicate with Secretary, W.I.A., Victorian Division, P.O. Box 36, East Melbourne, Vic., 3002.

(Phone 41-3535, 10 a.m. to 3 p.m.)

How I Became a Ham, ZS5FD. Different people are introduced to the hobby in different ways. Being hooked on Ham Radio is like some of the other drugs about, only much less dangerous.

"THE AUSTRALIAN E.E.B."

Apparently certain incorrect information was published in a recent issue of "A.R." and we have been asked by Dr. R. L. Gunther, VKTRG, to publish the following statement:

Unfortunately there was a slight misprint in the recent Review in A.R. Since January 1970 our three-year subscription rate has been \$2.90 (plus 5c if by cheque). Since our subscription rate just barely covers costs (not including promotion!), it could hardly be possible for us to offer a 33 per cent. discount for a three-year subscription.

"THE INDIAN RADIO AMATEUR"

February 1970—

IC Keyer, VU2JN. Detailed information is given on enabling construction of an IC keyer in a small metal or plastic box. The paddle is not described.

Practically all of the balance of this issue is devoted to matters discussed at the XIII. Plenary Assembly of the International Radio Consultative Committee (C.C.I.R.). A meeting at New Delhi and which commenced on Wednesday, 21st January, 1970.

"73" Magazine

June 1970—

A Practical DRR Antenna, W6WYQ. Expensive, difficult to build, mediocre antenna.

V.F.O. Circuit, KOHVK. In case you are tired of crystal control.

The Low Noise Antenna, W6JN1. High noise you're looking for?

Experimental Remote S.W.R. Indicator, by W2EY. Experimental remote S.W.R. indicator it might work.

The Little Wonder, Mark II, W5ZBC. Proving again that almost anything will radiate.

Can You Be Fun (with the Old DX-1), Staff. If you know the code.

Two Receivers From One Antenna, WA6UFW. Without succour.

Factors in Co-axial Cable Loss, W8XKJ. Like temperature and frequency.

Improving Trap Vertical Antennas, W2EY. By using an element.

Measuring Incident and Reflected R.F., VE7BS. It's the difference that counts.

Government Surplus, Straight from the Horse's Mouth, W6JAN. Hay, hay!

QRP, WA3JBN. 40 metre with 40 mW.

Ground Support for the Powder Puff Derby, W2CZ. Public service and politicians.

DX-1 Adapter, W6JN1. Is R.N.C. W8MEV. For 73c.

The Sly Beam, ZL1TAH. 32 elements on 2 metres. (This was published in "Break-In-1")

Three Unrelated Antennas, WA6CQP. Installing the Swan 250-C Noise Silencer, Measuring R.F. Output, Useful Cable Clamps.

Quarter Wave Top Loaded Mobile Antenna, W3KMW. For use on a mobile.

11 Element Two Metre Circular Quad, by W4KEA. 9 dB. forward gain.

The 433, ZL2JAS. For 10, 15 and 20 metres. (Published previously in "Break-In-1")

"73" Tests the Grundig Stational Receiver, Staff. Tunes in c.w., s.b.b., f.m., etc.

De-R.F. Your V.T.V.M., WA6FFJ. Works better.

Getting Your Extra Class Licence, Staff. Part XVII. Conclusion. Now go.

"73" SPECIAL, CO-AX. HANDBOOK

Part 1.—Co-axial Cables. The different kinds of cables, their properties, and why they are made that way.

Part 2.—Co-axial Connectors. A fantastically large variety of connectors are organised into useable lists. Descriptions, drawings and assembly instructions are included.

Part 3.—Co-axial Accessories. Descriptions of switches, S.W.R. bridges, attenuators, dummy loads, etc. Very complete.

Part 4.—Co-axial applications. Frosting on the cake.

A reasonably comprehensive survey of types of cable and fittings which can be expected to interest the Radio Amateur. Unfortunately the publishers did not see fit to include information of types of cables and fittings developed in Britain or on the continent of Europe. Nor do they acknowledge that Andrew and Phelps Dore, European patents and processes in the manufacture of their products.

Sub-Editor: ERIC JAMIESON, VK5LP

Forrester, South Australia, 5233.

Closing date for copy 30th of month.

All Times in E.S.T.

AMATEUR BAND BEACONS

VK4 144.300 VK4VU, 107m. W. of Brisbane.
VK4 53.000 VK5VF, Mt. Lofty.
VK4 144.800 VK5VF, Mt. Lofty.
VK6 53.000 VK6VU, Tuart Hill.
52.900 VK6TS, Carnarvon.
144.500 VK6VE, Mt. Barker.
145.000 VK6VT, Tuart Hill.
43.000 VK6VF (on by arrangement).
VK7 144.900 VK7VF, Devonport.
ZL 145.000 ZL3VHF, Christchurch.
JA 51.900 JA1JCY, Japan.
W 50.091 W6BKAP, U.S.A.

The contact between Doug VK6KK and VSD6A recently has caused quite a number to look back through log books, bringing back memories of the tremendous openings of 1956 and 1959. A note from Lance VK4ZAZ in Rockhampton advises the other Hong Kong station mentioned, V58CJ, was worked mostly by Townsville and Lancel, but heard by Lance and Bob VK4NG, and worked by VK4ZBE. However, all who have mentioned prior workings add their congratulations to Doug for his effort. Lance also advises receiving a card from KX6EK, who was receiving him 5 x 8 in April, but was mostly drowned out by JA transceivers and a 2-way contact was not quite made. However, he will be on again next autumn looking for VK signals, running 70 watts, mostly c.w., and working in our part of the band. KX6AJ was worked in VK4 in 1933, so this is not a new one, but might go to have nevertheless. Thanks for the news, Lance.

Passing now into the Eastern Zone of Victoria, I am indebted to George AX3ASV for a short note of activity there, where quite a bit of emphasis is being placed on Amateur V.U. construction. The minor winter Es season gave the Zone one opening to AX4 on 11th July when AX4ZXE was worked by AX3VBD, AX3ATV and AX3ASV on 53.033 MHz. The opening lasted for only three quarters of an hour around 1600, so the old adage "You've got to be operating to work them" still applies. The Zone net on the above frequency beamed west every Sunday morning.

The VK5 V.h.f. Group will conduct their Annual V.h.f. Field Day on Sunday, 27th September, there being two periods of operation, 0730 to 1330 and 1330 to 1630. The same stations may be contacted during the second period as may have been contacted in the first. Scoring will be between portable to portable,

or portable to fixed. Crossband operation is permitted, and contacts across the border to VK3 or any other States will be welcomed. The winners of the last two Field Days, Bob VK5ZDX and Wally VK5ZWW, have again issued a challenge to all comers, and it appears the gloves have been accepted in one or two quarters, so the Field Day may be very interesting.

I do note with great interest that the first Field Day for the season in VK3 will be run on the same date as the VK5 Field Day, i.e. Sunday, 27th September, but between the hours of 1100 and 1600. So the second section of the VK3 operations will coincide with the VK5 operation. Maybe some of the interested VK3s will be available to test their equipment early in the morning on 144 or 432 MHz, and give the VK5s that have been waiting at the border. The second VK3 Field Day will be on Sunday, 1st November.

A letter from Bob VK3AOT advises the above information, and he mentions quite a lot of work is being devoted to preparations for the forthcoming VK3 V.h.f. Convention on 10th and 11th October, when it is anticipated equipment will be on display for all bands from 52 MHz to 2300 MHz. I note amongst other things that the proposed programme there will be a 144 MHz transmitter efficiency contest (getting those portable transmitters ready for the Field Day?), a 432 MHz antenna gain contest, and a novel one called a "radio throwing contest". I have one here in the district I regularly repair which I would be glad to give a try to anyone interested.

Bob further reports activity near him is slack at the moment, accentuated by quite a lot of constructional activity, in which he is indulging himself, even to including 578 MHz. From the "grapevine news" Bob passes on, it certainly will pay us in VK5 to do some mountain topping over the Christmas holiday period. It could be very interesting indeed.

Thanks to the Geelong Amateur Radio-T.V. Club for another copy of their Newsletter. They are certainly an active body, meeting every Friday night in the Geelong T.V. Club, St. East Geelong. Their programme committee must surely be hard pressed at times to come up with something new to interest their members. I note the Club is going ahead with the construction of the second stage of the additional Club room. I note the inclusion in the current issue of their Newsletter of 14, dealing with four types of vertical antennas, one with an omni-directional pattern gain of about 5.5 db., and another with a forward gain of 9 db.

A comparatively new area for permanent contacts has recently been opened up by the transfer to Port Lincoln of the west coast of S.A. of Peter VK5ZPG, who operates on 144.800 using a 6 element beam about 20 feet high at present, and who can be worked even through the daylight hours in Adelaide with signals to 89, a distance of about 150 miles. If you refer to your maps you will see Port Lincoln is mostly a water path to Mt. Gambier and Warrnambool, should be pretty good even to Geelong, and real good to VK7. Peter is keen, so it's up to you chaps who live in the good path direction.

Colin VK5ZKR in Mt. Gambier reports everything quiet down there while the majority of the Limited license population study hard for the Morse examination in August. We wish them well, and hope that when they have passed, they will add c.w. facilities to their v.h.f. equipment, rather than turn it aside for h.f. operating only. 432 MHz looks like a lively band in Mt. Gambier this summer. Dave VK5ZOO, Trevor VK5ZTN, Dale VK5ZKR, Colin VK5ZKR and Chris VK5ZFA all operational. Chris has gone a stage further, and is using V.F.O. control on 432 MHz. s.b.w. with a QQ606/40 mixer, other stages to come later!

The S.A. V.h.f. Group station AX3AWI, has certainly been operating around a bit, and doing itself known. It was taken down to the S.E.R.G. Convention at Mt. Gambier in June and then at the end of July operated in the VK5 Intra-Contest, fielding transmitters and receiving on all bands between 160 metres and 432 MHz, inclusive, from the QTH of Wally VK5ZWW. He took a 6 foot square antenna and worked! It should again be operating in the VK5 Field Day on 27th September. The station was first licensed as VK5VWJ, but the Group felt this call rather restricted its activities, hence the later application for a change.

As news this month is a bit scarce due to the usual winter activity, it is probably of interest to pass on to you some news I do not remember. Reading through an October 1947 "QST" recently, I noted that the first 50 MHz. contact between Australia and the Hawaiian Islands took place on 27th August that year between Clarence VK5KL at Darwin and WTAC5/KH6 Pearl Harbour. This contact also set a new record for the 50 MHz. band, taking the distance to 5,330 miles. VK5KL used a

co-axial feed three element beam, running 100 watts to a pair of 234s. In the same issue was word of a new home station record for 144 MHz, working between VE1QZ and WJ0S9 for a distance of 2,000 miles. The bands have certainly lengthened since those days, but you will note the period was the maxima, or thereabouts, of the sunspot cycle two cycles ago.

That's it for this time. I will feature "Meet the Other Man" when I eventually get some replies from those to whom I have written. Thought for the month: "Despite jets, missiles and such, nothing goes faster than a two-week holiday." Till next month, 72. Eric VK5LP. The Voice in the Hills.

SIX METRE TESTS FROM GREENLAND

Amateurs using the 30 MHz. band are asked to look for OX5AP, Thule, Greenland, who is making five-minute transmissions on the hour, from 2200 to 2200 GMT daily. These transmissions are on 50.15 MHz. and will continue through this year, except for the period of 5th August to 14th August. He will listen for 6 metre signals in the five minutes after each test. OX5AP is available for 14 MHz. schedules between 2100 and 1100 GMT. Please report any reception or two-way communication on 30 MHz. band to the A.R.R.L.

(Official Bulletin No. 281 from A.R.R.L. Hdq., July 16, 1970, to all Radio Amateurs.)

W.I.A. D.X.C.C.

(S.W.L.)

Listed below are details relating to those Australian Short Wave Listeners to whom this certificate has been awarded:—

Cert. No.	Call	Name	Date Awarded
1	L3042	Eric Treblecock	21/1/65
2	L3022	Don Grantley	19/12/65
3	L3510	John Smith	19/12/66
4	L4018	Chas. Thorpe	11/7/68
5	L5080	Ernie Luff	25/1/67
6	L3229	John Smith	18/11/67
7	L6021	Peter Dowd	31/1/68
8	L2263	Bob Macintosh	19/4/69
9	L5085	Steve Reddifer	7/8/69
10	L3185	Rene Brannan	2/8/69
11	L3312	Maurice Batt	8/12/69
12	L3309	Bob Hanel	30/6/70

—Eric Treblecock,
S.W.L. Awards Mgr., W.I.A.

FREQUENCIES OF VK6WI

VK6WI broadcasts can be heard at 9.30 a.m. W.A.S.T. on Sundays on the following frequencies:

3.600 MHz.—SSB
7.082 MHz.—AM
14.1 MHz.—SSB
52.4 MHz.—AM
52.656 MHz.—FM
144.26 MHz.—AM

VICTORIAN DIVISION W.I.A.

MIDLAND ZONE

HF and VHF RALLY

on
SUNDAY, 1st NOVEMBER, '70

to be held at

LAKE EPPALOCK

in the

BENDIGO POWER BOAT CLUB ROOMS

Programme includes HF and VHF Scrambles, 2 mX Fox Hunt, 2 mX and 80 mX TX Hunts, Trade Displays, and competitions on the family. B.Y.C. eats, Barbecue and Picnic facilities available.

Further details from the W.I.A. Broadcasts or Zone Secretary, Bill Clark, VK3FY, High St., Kangaroo Flat, 3555

VK3 ANNUAL V.H.F. CONVENTION

V.H.F. ENTHUSIASTS OF ALL STATES ARE CORDIALLY INVITED TO ATTEND THIS CONVENTION WHICH WILL BE HELD IN

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OVER THE WEEK-END OF

10th & 11th OCTOBER, '70

Programme includes lectures by prominent workers in v.h.f. and microwave equipment, and competitions of interest to everybody.

Registration Fees: Amateurs and Listeners, \$2.50; Saturday night dinner, \$2.00 per adult and \$1.00 per child. Please register by Monday, 21st September.

For details send s.a.s.e. to—

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VICTORIAN DIV., W.I.A.,
P.O. BOX 100
EAST MELBOURNE, VIC., 3002.

Inexpensive family accommodation can be arranged.

Sub-Editor: DON GRANTLEY
P.O. Box 222, Penrith, N.S.W., 2750
(All times in GMT)

Here in N.S.W. we are experiencing some of the best weather we have had for months, no rain, and nice fine days have no doubt contributed to the large number of VK2 stations on the bands working DX. There is plenty to work these days, regardless of the band selected. I note several good openings on all bands from ten metres right down to 80, and have heard reports of some good openings on ten very early in the morning.

Still the best by far is 20 metres, with many of the rare ones being heard at this QTH, particularly in the evenings. Late afternoon and early morning have shown some good openings on 40 metres, with prefixes such as PJ, PG7, CT2, EA6, PY0, TR8, VP2, XW8, 9V1, CR5 and many others being heard and worked.

George ZL2AFZ passes on some interesting notes re activity on 80 metres by ZM3RF and ZL3AFZ. It is interesting to note that in George's notes, which will appear in "Break-In" at the same time as you read this, "it has been generally accepted that the DX season is over" and that the DX season formally ended on 1st Sept., through to 30th Mar., for both e.s.w. and s.e.b. Atol ZM3RF has been in QSO with ZL3AFZ since 1st Sept. and he reports that they still continue to QSO each day at 0435Z, though to the shortest day here (ZL). There is a possibility that the DX season is not yet possibly dead season. The frequency used is 3602, and reports so far are 440 watts. ZL3AFZ is a very experienced operator and he reports when we have a deep red sunset here (that is), his signals peak in many tests. Atol ZL3AFZ has been in QSO with ZL3AFZ on similar interests in respect to 80 metres."

Roy ZM1AAT/K is still active from the Kermadecs, and is anxious to make as many contacts as possible before he returns to ZL. He will be pleased to ask anyone and George ZM2AFZ will be pleased to pass any requests on during his daily log exchange.

George, as you know, handles the QSL chores for Harold AX0LD and says that there may be some delays in clearing the QSL for, although there are no unusual propagation conditions are such that conditions deteriorate so quickly that no really effective clearance of logs can be made at times.

I was pleased to receive a note plus bulletin from Stew WIBB who is hale and hearty after a long spell in hospital. Stew reports a finer ever contact on 160 metres between K5TFP and 21st January and EIR, HBSOM and G2PL back to back. Stew also reports WABU's treks out to VP1 where he had 187 contacts on 160; these included GM, G, EL, PJ, KV4, HR2, VE, W and VP2. Stew says that activity in the States on 160 has increased to the point where there is talk of the A.R.R.I. running a separate contest for that band. On WABU's side of the Atlantic, G land stations report the best season ever.

Operation from ZK1, ZK2 and ZM7, Manihiki, Niue and Tokelau respectively, should be well under way. Two rigs supplied by KRLY, NZ, were in the area in the early morning of July with a possible start about 25 July. They will be moving about quite a bit, so it is suggested that it may be advisable to keep an eye on the area whenever possible. Details even at this late date, 31st July, are a little sketchy, however those involved are ZLW, ZK2, ZK3A and SWR. The two most complex operations with varying conflicting reports are the OH2BH-ZA operation on Friday, 10th July. They did operate from Albania for 12 hours after which they were recalled. According to the very reliable Geoff Watts DX News Sheet, their gear was returned on 17th July and they left Albania with documents and a personal letter to the R.S. It is understood that they may operate from there again provided that sufficient notice is given. If you were one of the 700 contacts, then send your QSL to OH2BH.

Not so assuring are the reports of the ZAIC operation on 5th. July. This one came on with the proverbial great song and dance and mass QSOs were made. But despite all the fuss, there is no evidence that this was a legitimate operation, and until proof is forthcoming, it must be treated phoney, or a well planned hoax.

Details are being worked out in New Delhi by Larry K2EXP, for operation by VU2XPZ from the Lacdivides. There are some points to be worked out, but the crop up any time between now and September.

Bouvet Is., under its new prefix 3Y, is due for three months operation from October by ZSEANT. Watch your DX news bulletins for further information on this one.

There are several operations in the planning stages, none of these are guaranteed to occur, but they are very strong possibilities. CEO in August by CE3ZN. A jaunt to TY, Dahomey by 5V2WT, and 9K3 operation from Kuwait/Saudi Arabia by MP4BHH in October.

ST2SA is on the air using c.w. and will be on a.s.b. when he completes building a recently donated kit. He operates 0330 to 0430z on 14021, 14040 and 14080. Also c.w. on 21033 on Saturdays between 1930-2100z. I understand K4MZU takes a list on 14290 at 0300z, and you can work him cross mode.

• HB9AJH operated from 25th July to 1st Aug. from Liechtenstein on all bands. QSLs for this operation go to HB9AJH, Paul de Graff, Rue L'Envers 12, CH-2605, Sonceboz, Berne, Switzerland.

K5QHS/KS4 operated from Swan Is. for the first week of July, together with W4VPD/KS4. Unfortunately, one rig broke down in the process, however they continued to have a successful operation. QSLs go to Box 588, Stuttgart, Ark 72100 U.S.A., the call book address being incorrect.

From Comoro Is. comes the news that Yvon F8BCY has been staying with F8BCE and using the call F8BCY. He returned home on 3rd July, but will be back on Comoro in October. and asks that QSLs for the operation go to F8BCY.

The QSLs for the very short operation held on Wallis Is. by Thomas FK8BO under the call FW8BO should be sent to him at his home address, which is Thomas Savelli, Box 28, Noumea, New Caledonia.

I have rejoined from writing too much about the present jail by Gus Browning for one reason, and that is because he moves around so much that he is always a jump ahead of the news sheets. He has had a share of bad luck this time, he was forced to return to FBI after the incoming tide took two of his boats. He was forced to leave his action from Geyser Bank, signing AC9A very soon and by 25th July had made 5,000 QSOs from there. Following this, he ran into some trouble and was forced to leave the boat. He got little sleep and was forced to tie himself into his bunk. Despite this, plus the fact that he had to send fares to a passing tanker for his boat, he was able to make a good haul. He is signing VQ9A/F. There his generator quaked up and he was forced to hire another. Next step was for Blenheim Reef and Chagos, where he was forced to leave the boat. He is operating as AC9A/BR where he planned to remain for a week before sailing over to Chagos for two days. From there he was due

The Long Is. DX Assn. News Sheet makes a request re the QSL manager for Gus Browning. They would like to emphasize that he is W2MZV not MZB as appeared in some sheets. W2MZV is Herman Bohning, Box 162, Yonkers, N.Y., 10702, U.S.A., and monetary assistance should be drafted to the World Wide Radio Propagation Study Assn.

I note an item in Geoff Watts DX News Sheet to the effect that VK/ZL operators are complaining that they are not having any QSOs as 0500-0800z is the only time we can hear the Indian Ocean, at this time of the year. Personally I have not heard a sign of Gus over here in the Eastern States, how about some word from VK6 on the subject?

A recent station which raised the DX eyebrows was 4N2CI, he is still on the air at time of writing and is operating from Cieve Is., which is in the Dalmatia area of YU land, around the Adriatic. His QSTs go to YU1BCD.

JD1ABO on Minami Toroshima, formerly Marcus Is. will work once a week until September to a list compiled by JAIBSO, JA1UQP, JA2PJC or JA0CUV/1. The JA station will give the date of the next appearance by the Marcus station, who hopes to be on the three higher bands. QSL to JAIBA. The other operation to Marcus as proposed by KAIB is cancelled.

Despite internal troubles in Jordan, JYI is still active and has been appearing at around 1700z and working until 2300z into the States. He is working to a list compiled by WA2CPQ and WA2URS. It is believed that JY2/3/4, etc., will appear on the scene shortly.

Bob VEZEWEY is doing fine with his DX-pedition in the West Indies. In company with Gary VE3GQ, he operates from July 14-18 from Trinidad, July 19-20 from St. Lucia, July 21-22 from St. Vincent, July 30-31 Trinidad, and August 1-2 from Tobago. QSL to Bob's home QTH for both operators. VP2DAJ heard from Dominica at this QTH near the end of their stay working into ZL and strangely he was about the only signal on the band.

Some months for the prefix hunters. HU2 was a special prefix used by El Salvador (YS) stations during the WPK Contest, SXDX was a special station operated by SVIDE from a mountain north of Athens in March, TC2CW was a special call used by TA2CW during the WPK Contest, and WZ was used by EA2W for the special call for the same event. Brazil really went to town in this contest using VZ, ZW, ZX, ZY and ZZ, and if you want a QSL from any of these, send yours to the corresponding POTA call sign. Colombia, not to be outdone, substituted J3 for the normal HK prefix during the Contest.

A note in "Monitor" from Boles W9VZP, pointing out that he is not the QSL manager for HL9KH, although he did handle cards for Don Miller when he operated the station from Nov. 1952 to Dec. 1963. Since then the call has been issued to the Osan Amateur Radio Club, and QSLs should go to Director of Amateur Operations, HQ US Forces, Korea, APO San Francisco CA 96301 U.S.A.

IZIAJ and IZ0AJ were the calls used by IIAJ during his vacation to Ponza in mid May. Amateur QSLs should go to VE3ACD, while S.w.l. reports will be handled by IIAJ direct.

UWOIE, whose signals pound in here on 15 and 20 metres, is situated in Asiatic Russia Zone 19. Usually heard on 21302 s.s.b.

All Amateurs who followed the voyage of Thor Heyerdahl in his reed-boat "RA 2" across the Atlantic, were pleased to hear of his safe arrival in Barbados a few weeks ago. Quite a number of contacts were made with Amateur stations during the voyage.

FKSKAA has been putting a bumper signal out of late. Although a little rough around the edges, his c.w. signal is getting out very well, and is on nearly every evening around 0700 on 20. His address is Box 23, Noumea, New Caledonia, handle is Francois.

Another station noted quite regularly in the late evenings is YB1BC with a very good c.w. signal on 20 metres. Says QSL to Box 288, Bandung, Indonesia Rep.

For the /MM hunters, or mobile award chasers, there are several on at present. K7LRA/MM, G3JFF/MM, WB8FT/MM and W4EWS/MM have been amongst the regulars heard at about 1000z, L7LRA/MM often appears on 40 metres working a group of /MMs.

ITISEZ/IP, Silvano, has been reported on 26 s.s.b. in the evenings. He is QRV from Favignana Is. in the Egadi group. QSLs to go to Silvano, Amenta, Box 163, Palermo, Sicily.

Some KG6 information to hand, firstly KLVDTH/KG6 wants his QSLs sent to Charles L. Wareham, C/o R.C.A. Global Communications Inc., Box EH, Agaña, Guam, 96910. KG6SY is on from the Marianas and asks for QSLs to Box 209, Capitol Hill, Saipan, Mariana Is., 96950.

Two stations have been active from San Marino recently, they are MIB whose QSL manager is WA3HUP for all stations other than U.S. His manager for U.S. stations is WA9HYS. The other is MII, whose cards should go to IIBNZ.

A note on the bottom of Geoff Watts News Sheet of 14th July to the effect that EA9, Inl, was incorporated into Morocco on 30th June and ceased to be a separate D.X.C.C. country as from 14th May, 1959. A.R.R.I. D.X.C.C. I presume.

QTH SECTION
CR4BC—C.P. 36, Sao Vicente, Cape Verde Is.
CR6FR—C.P. 7, Cabinda, Angola, West Africa.
CT1WA—C.P. 446, Porto, Portugal.
CX8BBB—Apto 934, Montevideo, Uruguay.
EA8HB—Cas 547, Las Palmas, Gran Canaria,
Canary Is.

ET3ZU—Box 379, Asmara, Ethiopia.
FR7ZW—Box 793, St. Denis, Reunion Is.
OD5EJ—Box 8148, Beirut, Lebanon.
TF3WKI—Box 21, U.S. Navy Sta., F.O. Nou-

YB2AG—Box 88, Samarang, Java, Indonesia.
YB3DC—Box 27, Surabaya, Java, Indonesia.

My thanks this month to George Studd, ZM2AFZ, Long Is. DX Assn., Geoff Watts DX News Sheet, Stewart Foster of the I.S.W.L., "Monitor," Stew WIBE, and Bernard Hughes of G-land. 73 for the present, and how about some news from the VK gang?—Don L2022.

AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—
SO SHOULD A LOT MORE
AMATEURS!

FEDERAL AWARDS

W.A.V.K.C.A. AWARD

The following Amateurs have received this Award during the period 1/7/69 to 30/6/70:

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
371	WGUGZ	383	WA2FQG	407	HRISWG
372	V8EAL	389	JA1HNM	407	WHURH
373	GJTXF	390	V86FX	408	9JGJ
374	GAJZ	391	JA1DFQ	409	JA2YC
375	PR7ZG	392	VE4ZX	410	VOICU
376	JA4SZ	393	UA6JU	411	JA6GR
377	G3JBU	394	VE4ZX	412	JA6GR
378	W6WJQ	395	YAIHD	413	JA5YJ
379	W6ZC	396	WB6DXU	414	ZL2FA
380	DLBVF	397	JA1J	415	JA4FM
381	ZL1BDW	398	ZL1QN	416	W6YRA
382	O8EGL	399	JA2AYX	417	UQ2AN
383	CRBAI	400	H8BAHA	418	UA6KA
384	PIAZ	401	JA1J	419	ZL1BDN
385	G3YVF	402	CR7Z	420	JASSW
386	ZL1AFQ	403	DIJVS	421	JA1RWU
387	CT1BH	404	JA2Q/L	422	JA1AAT
		405	JA1GTF		

W.I.A. & M.H. W.A.S. AWARD

Cert. No.	Amendment	Additional Countries
78	VK3ZJ	3

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award:

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
467	G3VOF	496	G3OLY	525	OKIBY
468	WISWD	497	JA1HVS	526	AKZLZ
469	WAWXKL	498	W6ISQ	527	AK1BPN
470	ZM3NY	499	DK5FX	528	AK4FX
471	W2CVY	500	VE1AI	529	K4UV
472	W2BKB	501	AX3ZA	530	K8RYP
473	Z5SOA	502	AX2TVM	531	W7TGN
474	W3DJZ	503	ZM1AKJ	532	W1AGA
475	VE5FB	504	WAPYL	533	ZM1BIN
476	Z5BQFQ	505	ZM5BQ	534	VE5DAV
477	GA1Z	506	ZM6A3W	535	AX7BE
478	VE5LH	507	W6GJG	536	W4TRP
479	AK3VU	508	VE5AVR	537	PA6ALO
480	ZM1BYW	509	VE5BYN	538	VE5POD
481	G2NH	510	VE3GGU	539	K7LGM
482	W4HNO	511	AX2AJY	540	ZM1SG
483	AK3VK	512	VE5BQ	541	VE5DAV
484	W6VJO	513	W3PM	542	W4RA
485	485DA	514	K3PAW	543	W4CVC
486	GRCP	515	NP4BIA	544	ZM1AIW
487	W2PFP	516	VE5CZC	545	UW4PI
488	DL8DE	517	AXAUL	546	UGWAV
489	ZM1AID	518	W7VSE	547	UW1E
490	W6WJQ	519	JA1J	548	ZM1BHC
491	K1NJE	520	11RC	549	VE5EA
492	ZL1AXA	521	ZM1KX	550	AX3JS
493	W6WJQ	522	VE5CZC	551	AX3JS
494	W6WJQ	523	VE1CV	552	W6WVQ
495	K4NE	524	DM2AUO	553	ZM1AJU

CONTEST CALENDAR

3rd/4th October:	VK-ZL-Oceania	DX Contest
10th/11th October:	VK-ZL-Oceania	DX Contest (c.w.)
10th/11th October:	R.S.G.B.	28 MHz. Phone Contest
20th/25th October:	R.S.G.B.	7 MHz. DX Contest (c.w.)
7th/8th November:	R.S.G.B.	7 MHz. DX Contest (phone).
14th/15th November:	R.S.G.B.	1.8 MHz. Contest
15th/16th November:	R.S.G.B.	1.8 MHz. Contest
13th Dec.	V.F.F. Memorial Contest	
13th/14th Dec.	1971: John Mosey Memorial	National Field Day Contest

—D. H. Rankin, F.E.

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Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

"IMPRESSED BY THE KINDNESS AND GENEROSITY"

Editor "A.R.," Dear Sir,

May I through the pages of "Amateur Radio" be permitted to thank all the many Australian Amateurs who have made my two recent visits to parts of your country so enjoyable.

I first visited Australia last November in the Far East Flingship, H.M.S. "London," when we spent a week each in Hobart and Melbourne, and two weeks in Sydney. This year the Flingship H.M.S. "Blake" paid visits to Adelaide and Sydney, where we had the honour of being present for the Cook Bi-Centennial celebrations with H.M. The Queen.

During both visits I have been impressed by the kindness and generosity of the "VK gang" and have enjoyed the hospitality of many homes and rigs. The contacts I have made have also been strengthened by further contact over the air whilst I have been travelling around the Far East.

To list all those who contributed to making my visits so memorable would fill a long book, but may I record the following Amateur call signs and names who will always remain most in my memory:

VKs 2BJL, 2BPN, 2VN, 3XB, 3KS, 3CDR, 3RG, 3DS, 5FM, 7GC, 7DK, 7KJ and 7AZ. Also S.W.'s Eric Tretham and Keith Hatch.

To them, and many more, once again my thanks for presenting Australia and her people in such good light. I hope to renew the acquaintances from time to time through Amateur Radio.

73 es DX to all de Mike.

—G3JFF/MM; ex VS8HU, 9M2MA, VR1M, VR2EA, YJ1MA, ZB3AM, etc.

Chief Radio Supervisor of J. Matthews, Staff of P.O.F.F.E.P., F.M.O. Singapore.

"SERIES A.C. CIRCUIT"

Editor "A.R.," Dear Sir,

Herewith a few comments on Mr. Cullinan's article, "Series A.C. Circuit" ("A.R.," Aug. 1970), some statements in which could be misleading.

1. Impedance is not a.c. resistance. Impedance is the combined opposition to current flow of resistance and reactance. A.c. resistance is d.c. resistance plus the added effects of eddy currents, hysteresis and skin effect.

2. Pythagoras states: $(\text{side } a)^2 + (\text{side } b)^2 = (\text{side } c)^2$

Not, $\text{Hypotenuse}^2 = \text{equals (side } a)^2 + \text{side } b)^2$

There is quite a difference!

3. I (lower case) is an imaginary number, the square root of -1.

This, it would seem, is what the question calls "total power." So Mr. Cullinan's calculations are in order here, but the 8,536 are volt-ampere, not watt, by voltage.

5. Phase depends on the load, not on the generator. A generator delivers a voltage. The type of load that voltage is connected to determines whether the current will lead, lag, or be in phase with the voltage.

6. You pay for true power used, not for reactive power. The supply authorities require the consumer to keep the power factor as near unity as possible, as otherwise a given amount of power requires more current, which is not paid for, but which nevertheless represents IR losses in the transmission lines and for which the supply people have to pay. Out of phase current however does no work for you, as it is not backed up by voltage.

7. Since the power factor was not specifically asked for in this problem, the true power could more readily have been calculated from $P = \text{power FR}$, equals $17.96 \times 17.06 \times 28$, equals 7273 watts.

A point of interest here is that neither the inductance nor the capacitance dissipates power; any heating of these components is due to their a.c. resistance.

—G. Craigs, VK2AYG.

PROJECT AUSTRALIS

The Institute and Project Australis is most appreciative of a donation of \$200 recently received from the Commonwealth Banking Corporation.

This donation will be applied of course to the present project and we hope that the members and even non-members of the Institute will be moved to make contributions to a project which users in a new era of communication available to the Amateur Service.

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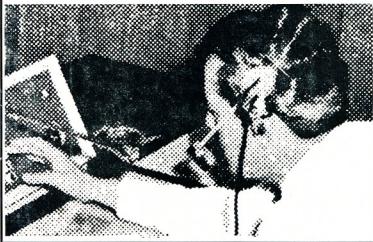
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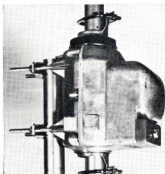
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